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THE

WHITE LEGHORNS.

FROM THE

SHELL TO THE EXHIBITION ROOM.

By H. H. STODDARD,

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PREFACE.

Never, in all our experience at poultry exhibitions, have we seen a finer display of one breed of fowls than on an occasion lately. We visited a friend of our youth. Entering the well-kept grounds, we were enchanted with the display of flowers, shrubs, beautiful trees, sparkling fountains, fine statuary,—all the creations of wealth and taste. Passing through the garden we entered an enclosure, closely shaven, a velvety lawn, having a small fountain, with here and there a shrub; on the green grass, one cock with six White Leghorn hens—the cleanest, whitest and fairest of the breed. We turned to our host and said, "How do you manage to keep the fowls so white and their yard so neatly?" "Oh," said he, "they come out here one hour a day to take their *constitutional;* the gardener keeps them clean, and gives them insects. By the way, are you not going to give us a book on White Leghorns?" "Certainly," was the reply. And here we dedicate to our friend of the green lawn the result of our effort.

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THE WHITE LEGHORN.

SOME seven years since there was a prolonged discussion of the origin of the White Leghorn fowls which had become quite generally spread over the United States. With the merit of the claims of rival "first breeders" we have no wish to meddle. Simply stated, there were two prominent early arrivals of White Leghorn stock, in this country; the one known as the Lord importation, and the other as the Stetson.

Prior to the introduction of these birds there had been, we doubt not, other arrivals of white fowls, from the port of Leghorn, which, in shape, ear-lobes, and all essential points, were as truly Leghorn, in the meaning of the fancier, as any of the descendants of the recognized importations of later years.

Between the first recognized arrival and the general dissemination of the young stock from it, there were also, doubtless, hundreds of fine specimens which survived the perils of the sea, and reached American ports only to furnish a juicy dinner to some old salt who "kept ship," and hardly knew the difference between pure poultry and salt junk; and too, some which were sold ashore and were bred for

more legitimate purposes. However they came, they are here now to the number of many thousands, and fanciers have for years been at work on a practical solution of the problem of making of the best native material something still better. With their success and its causes we have a far stronger interest than can be felt in a past so remote as to have but little influence on the nice breeding of the present.

CHARACTERISTICS OF WHITE LEGHORNS.

White Leghorns are naturally very timid, but with a little care can be made very tame. They are good foragers, and when they have a chance to roam will pick a good share of their living. They mature early, often lay at four or four and a half months. Cockerels crow at six weeks, and are first-class broilers at twelve weeks. There is one thing that will always make them favorites: they feather so early, making them *constant* beauties from the time they are hatched. Like all so-called "*non*-sitters," they will occasionally become broody; very seldom more than once during the season.

White Leghorns are and should be a small breed of fowls. The smaller birds are the most stylish and the best layers; increase their size and they decrease in symmetry. For shape we prefer a long, slim body, similar to a game; head small and fine; neck long and slim; shanks the same, good length and not large; legs thin, flat, and with small bones; toes long and well spread; full, well-rounded breasts. Combs of cocks, medium size, fine in texture or finish, evenly and deeply serrated, having five well-rounded points, not counting the first short point in front, or the projection

or back part of the comb, the lower part of which should run back on a *horizontal line* with the top of the head.

LARGE OR SMALL COMBS.

Frederic Spring, New York City, writes to the *Poultry World* as follows:

"In looking over advertisements, I notice one as follows: 'White Leghorns, small combs,' etc. Now, is it possible that *small* combs are considered a mark of fine breeding in Leghorns—a breed whose chief beauty (to my taste) consists in a fine large comb and good-sized wattles? I do not mean that they should be out of proportion, but that they should equal the Black Spanish in every particular. I have also written to breeders of some reputation and standing, asking for Leghorns with large combs, and have received answers: 'Do not breed birds with large comb; would not take them as a gift;' while, on the other hand, I have purchased some fowls from the acknowledged leading Leghorn breeders of the day, and they have good-sized combs. Now, what does this mean? I am young in both years and experience; and if some of the wise ones would explain this, they would oblige me very much."

To this Mr. M. L. Kidder responds as follows:

"I consider the subject of no small moment for all the Spanish varieties, especially in this northern climate, where it is almost impossible to keep those 'fine large combs and good-sized wattles' without artificial heat, even through one winter, and not have them much disfigured by Jack Frost.

"Again, those large combs are much more apt to be

coarse in texture, with side sprigs, twists, wrinkles, folds, lopping, unevenly cut, etc.

"If he were to ask what size they shall be, we are obliged to answer: Our *Standard* does not tell; it only says, 'medium size.' Now, then, how may we judge? Of course only by comparison and common sense. The severity of our climate demands that combs of all Spanish or Leghorns be bred as small as possible and not detract from symmetry. The wattles I would breed as long and pendulous as possible and not interfere with the above.

"F. S. may ask, What is a large, medium or small comb? Take all the matured birds in your own yard, also in your neighbors' yards, and measure the comb's length from front to rear, also extreme height from top of head. As I plead guilty to being one of, if not the first to advertise 'small combs,' I may be allowed to give the dimensions of my best breeding cock, which are, length, $3\frac{3}{4}$ inches; height, $1\frac{3}{4}$ inches. I have only spoken of cocks, as it is not necessary to go farther to illustrate. If I can by this means call out an exhaustive discussion of the point by abler pens, my purpose will be accomplished, and much good come to this valuable *egg-machine.*"

The front part of the comb should start about midway of the beak, and describe an easy curve up and back, with no twist, wrinkle, or dish, but perfectly smooth on each side. Size of wattles in proportion to the comb, well rounded, and having soft, smooth finish. Comb and wattles of hen the same shape, only smaller, and comb falling to one side, but *not* to cover the eye. The tail carried low on a Leghorn is entirely foreign to the breed, but a real true, genuine Leg-

horn cock should carry his tail as the *Standard* requires—"*very* upright." The sickle feathers at the base should start a trifle forward and cover the whole tail, composed, beside the sickle feathers, of three pairs of smaller curved feathers, seven main or upright feathers, and an abundance of soft downy feathers at the base.

In treating of the variety of White Leghorns, we should take into consideration the proper accommodations for the fowls, as they demand good protection, and must have warm buildings in the cold weather; and the first matter that demands our attention is

PROPER GROUND LOCATIONS.

It is not known everywhere—so we conclude from recent observation, in our travels among poultry breeding farms—that a great deal depends upon the *ground* locations for our fowl-houses; where excellence in producing chickens and fowls is aimed at.

It is clearly shown that that fearful scourge, *typhoid fever* among humans, may be prevented, upon the observance of proper and wise precautions. It is well known that this noxious disease originates, seven times in ten, from putrefaction, either of animal or vegetable matter, adjacent to the victims' premises—or both, perhaps.

Roup, sore head, black comb, foul nostrils and eyes, fevers, and death among poultry are most frequently caused by the foul, damp, or swampy ground locations wherein the fowl-houses are erected. Nothing is more pernicious than this, and nothing so swiftly conduces to illness and death of thousands of fowls as does this mistaken choice of a site

upon which to place a chicken-house. And yet there are hundreds of such all over New England and elsewhere to-day.

Either the lower grounds whereon such houses are built receives the wash of the dwelling-house filth, or it absorbs the wash of the surrounding land. Here the miasma accumulates (perhaps imperceptibly at the surface) under the ground-floors of the hen pens, and there it rots and ferments, and throws upward its fever-bearing fumes, night and day, for yard chickens to breathe and smell, and suck into their systems.

Then the novice or careless farmer who is prone to think that "any hole is good enough for the pigs and chickens to huddle in," complains of "roup," "cholera," "consumption," "sore eyes," "dumps," etc., among his poultry, and goes to his neighbors, or to his poultry or agricultural editor to enquire about remedies for the evil.

The first cure for all this is prevention. Keep away from damp grounds in locating your own or your chicken-houses, and thus avoid what you cannot cure while any living being or animal is subjected to the perils and bane of wet foundations to their habitual dwelling-places.

The style, size and general appearance of the fowl-house must depend so much upon the location and upon the means and taste of the owner, that we forbear entering on its discussion in this place.

FLOORS.

Turning to the interior arrangement of the house, our first thought should be for the floor, which may be of either

of three different materials—earth, or boards, or cement, according to the outlay we propose to make and the nature of the soil on which the building stands. If the house is on sandy, porous land, an earth floor, raised a foot or more above the natural level, will answer very well, and will carry off moisture rapidly enough to keep the surface dry. Should the soil be heavier, we shall find it necessary to lay a drain, of rough stones or tiles, lengthwise of the building before we place the dirt for the floor proper; this is, of course, for the purpose of carrying off all the water that might come from surrounding places on the same level. We remark, however, that a location wet enough to need a tile drain should not be adopted, unless in a case of dire necessity.

Having brought in the necessary earth for the raised floor, we must arrange it evenly the whole length of the house, and beat it enough so that the fowls cannot scratch it up. A mixture of clay, gravel and sand can be rammed down till it is solid enough to defy all ordinary scratching operations. On this floor we can strew road-dust or coal-ashes to absorb the droppings of the fowls; and rest satisfied that, though the work has not been expensive, it is well done, and will prove a paying investment.

Should we decide on laying a board floor, a similar foundation of earth should be prepared before the floor is laid, in order that the ground under the boards may be dry, and we can then lay our wooden floor to suit our convenience, or as the stuff cuts to advantage. When it is practicable, it will be found a good thing to let the planks run lengthwise of the house, to insure ease in removing the dirt

which has lost its absorbent qualities. The hoe, or other implement used in scraping, does not work well across the grain of wood.

Cement floors have been but little used, but possess some advantages not to be gained by the other kinds of floor we have described. They should be laid on a bed of hard earth, and be slightly crowning, but not so much so necessarily as those made of plain earth, and should be covered with loose, pulverized soil, in the same way as those before mentioned. The principal superiority of this floor lies in its imperviousness to any dampness or noxious gas which may be generated beneath it, and in the ease with which it may be cleaned, by the use of a broom, after the bulk of the droppings has been removed to the manure heap.

FEEDING-TROUGHS,

Properly constructed, ought to be generally substituted for the wasteful practice of feeding from the ground. The "reasons why" are obvious. Where there is a scramble for the food that is thrown helter-skelter, the weak are prevented by the strong from getting their share until the latter are satisfied, and the food is trampled into the dirt. It is no advantage to fowls to eat sand, dirt, or gravel mixed with their food. The gravel and other indigestible substances necessary to the proper trituration of their food in the gizzard, can be given separately, and should be. A simple trough may be made, defended by slats placed vertically, or on a convenient angle, with spaces sufficient for the passage of the head, thus preventing the trampling and soiling of

the food, which will not be wasted, as in the case where it is thrown carelessly on the ground.

VENTILATION.

The importance of good ventilation should not be overlooked. One may have the best stock and supply the fowls with the best food, yet their blood may be poisoned by foul air. Fresh air is as necessary for all kinds of animal life as for the support of human life and the occupants of poultry houses are no exception to this rule. Pure blood and healthy condition of the system can no more be secured when hens are shut up in unventilated coops than can the wretched specimens of humanity command such life-giving adjuncts when groveling among the slums and cellars of certain crowded, filthy city districts. It is impossible to over estimate this necessity for pure air to all who breathe. The heart sends the blood to the lungs, which divest it of impurities collected in its travels through the body by means of veins and arteries, and to meet the oxygen of the air which brightens its color and prepares it to nourish the body when it again goes its rounds through the system. Of course, if by previous breathing of the air it has become vitiated and deprived of its carbon, the blood fails to find its best assistant when pumped into the lungs and returns with all its impurities, thick upon it, to reduce the strength of the body and open the way for disease and ultimately death.

Fowls so restricted and kept from fresh air must invariably become more or less diseased, and their flesh less wholesome in consequence, to say nothing of the discomfort

they endure sweltering in stifling air in summer, and prevented in winter from taking the active exercise necessary to health.

DUST BATHS.

Winter and summer, the fowls delight in having a place to dust themselves in, for it seems to do them as much good as it does human beings to take a bath in good, pure water. Just see how the fowls nestle down into it, how they lie, first on one side then on the other, using feet and wings to cast the dust on every part of the body, to their evident delight and to the discomfiture of any lice which may have found a harbor under their heavy coats of feathers. In the winter the wet and the frost effectually prevent any dusting from going on outside, so the baths must be supplied in the poultry house or under some other suitable shelter, and a variety of things are used for the purpose, such as fine, dry street dirt or fine soil of any friable sort, and it will not be found a good practice to mix wood ashes with the street dirt before putting it into the dust boxes, though some breeders follow it. Finely sifted and dry coal ashes are also used. Three or four boxes about two feet square and about eight inches deep, made of almost any kind of lumber convenient, answer the purpose well, and should be kept constantly supplied with the dusting material.

AGE OF BREEDING STOCK.

There is a matter of serious importance to be considered in connection with breeding stock and this is the age of the fowls. The rule of mating a two-year-old cock to pullets

and a cockerel to hens a year or two older has become tolerably familiar to all who have read the *Poultry World* for the past few years, and the reasons for such matings have been pretty clearly laid down. Breeding from pullets and cockerels is a thing which ought to be enrolled among the "Dangerous Experiments." We acknowledge that the Leghorn is the most precocious of all domestic fowls in reproduction as well as other matters, but in this direction, though the progeny of young fowls may in solitary instances be as good to all appearance as that from more mature birds it is not safe to experiment. The fowl hatched last March though it approaches very nearly the semblance of a specimen raised a year earlier, is not by any means ready to produce eggs that will throw *strong* as well as nicely marked chicks if mated to a male of the same age and degree of development. There must be somewhere the *staying* qualities which only a fowl that has had time to mature can possess. No specimen can transmit to its offspring the qualities it is not old enough and mature enough to possess itself.

Experiment has proved the fallacy of supposing that the apparantly redundant health of youth can be relied on for strong and healthy progeny.

Flocks in which all the older birds are killed off yearly and none but pullets and cockerels retained as breeders have run out and become "spindling" with marvelous rapidity, and the owners been left to regret their destructive policy, which leaves them no resource but the sale of their stock at market prices and the purchase of fresh blood.

Experience has proved a costly teacher to these breeders.

NUMBER OF HENS TO A COCK.

Our breeding pens should consist of as many hens as the male bird can give proper attention to, and no more. But the exact point when we reach the proper limit is a difficult thing to set down in black and white, simply because the best number is variable with members of the same flock. Experience alone can determine the matter to the satisfaction of the breeder, and we shall only indicate the results of our own experience as a sort of gauge for those who are beginners in this line. The estimates given by various breeders vary all the way from five or six to fifteen or even twenty hens to each active vigorous male, but the latter estimate is one which in the practice we have never found satisfactory. In the majority of cases ten hens will be found to be as many as one cock can properly attend so as to insure the best average of fertilized eggs and the most robust chicks.

When the cock to be used has met with some accident such as very severe freezing of the comb and wattles or has been badly cut up by fighting, though he is by no means incapacitated for breeding, his power is somewhat impaired and we should advise reducing the number of the hens in the breeding pen from ten to five or six.

In picking out the females to run with any particular cock it is well to make a trial mating early in the season, and cull out those—if any—to whom he is ugly or indifferent until only his favorites are left. Of course this can only be done when the fancier has time and opportunities to be very observant.

THE BIRDS FOR MATING.

With all white fowls the points of symmetry and color are of great value, not only in selecting choice specimens for exhibition at the various shows, but in making up breeding pens. A trained eye will readily detect imperfections of shape, of a prominent character, and the aid of a little handling will enable the expert to score the specimen to a half point; but the novice in White Leghorn breeding needs a few hints to aid him in detecting defects.

A croppy bird is one that has in some way an undue distension of this part. Sometimes there is simply a temporary enlargement owing to an excessively hearty meal just eaten, and, in this case, quite frequently the crop is not only swelled out, but carried to one side. Such a transient infraction of symmetry can be removed by care in feeding and is of course not a permanent blemish. If, however, the crop has long retained its ungraceful and unnatural shape we can not safely use the bird as a breeder or for show purposes. A malformed crop may not be hereditary, but it is better to stand no chance of transmitted malformation of the parts.

The other points of symmetry to receive attention in selecting the stock to be mated for breeding are a tendency to dropping down behind in the hens, and the carriage of the tail in the cock. The former needs nothing beyond simple mention and the latter but a brief explanation.

The ideal carriage of the tail of a White Leghorn cock was long a subjeet of controversy; chiefly because the question was not raised until a large number of breeders had

acquired a fixed type in their stock, and by constant usage had become convinced, each for himself, that his favorite form was the proper one.

The best breeders of this variety have now, however, but little trouble in rearing a large percentage of cockerels of the required carriage in this particular. A perfect tail of a male fowl of this breed should rise nearly perpendicularly, and sweep over in a true, easy curve, to the extreme tip of the sickle feathers. The stiff feathers of the tail should stand at an angle of about fifteen degrees from the perpendicular. A pure white cock of such a shape as we have described, mated to hens of good outlines, well filled out, will prove very satisfactory, both as a stock getter and as an exhibition bird.

On the subjects of comb, ear-lobes, wattles, and other parts which need special discussion, we quote a communication from the veteran breeder of White Leghorns, J. Boardman Smith :

"In mating White Leghorns, I find the best combs are produced by mating a cock having a fine small comb, with hens having combs above medium size ; we then get the same as we breed from. A small comb on a White Leghorn hen never looks well. It should be remembered, however, that when a hen is not in laying condition her comb is often contracted, and would appear to be under size.

"If it is desired to increase Leghorns in size, it can easily be done by high feeding early chicks and separating cockerels and pullets. My 'Biddy Malone' (98) was hatched in March, and at six months weighed five pounds.

"I do not believe in breeding from '*pure white* ear-lobes,'

as they are apt to throw a pale yellow leg and beak, also a white skin; and a *straw*-colored ear-lobe is much richer, and gives a healthier appearance to the fowl. The last season there has been a demand for straw-colored ear-lobes. I do not think we can breed cocks pure white in plumage and with deep yellow legs, beak and skin."

STRAINS.

The term strain is one of comparatively new introduction in poultry literature and is used to denote the individuals of a particular variety that have been bred under a special system of culling and general treatment until they have attained a certain degree of uniformity in special fine points of marking and blood. Individuals of a particular strain can generally be readily picked out by the original breeder even when mixed with fowls of the same variety and closely resembling them.

Webster defines a strain as an inborn tendency and the definition is very applicable to the use given the word in relation to poultry for the outward similarity of all the individuals of a given strain is but a carrying out of their inborn tendency. Strain stands at the top of the ladder, made by the narrowing expressions used in the fancier's vocabulary and fixes the definition of certain fowls more clearly than any of the preceding terms. All domestic fowls are of the same genus; all the Brahmas, Hamburghs and Leghorns and the other breeds are of the same species, and each of these is of itself a breed or variety as we choose to call it, but a strain of White Leghorns is composed of individual members that are not only White Leg-

horns but *creme de la creme* as distinguished from others of the same variety.

VALUE OF A STRAIN.

Having considered in what a strain consists, we proceed to the discussion of its value. There are strains and strains. In all varieties of thoroughbred fowls, our opinion, whether or no the strain is worth anything very much, depends on the knowledge we may have of the breeder who originated it and the persistence with which he has kept in view a certain ideal form. Give us a man who has a head full of queer, cranky ideas, and is moreover so situated pecuniarily that he can give full rein to his whimseys, and there can from good White Leghorn stock, be produced uncouth specimens that yet will have a certain degree of uniformity and be even able to reproduce their like. But to what purpose does any one believe these fowls could be taken by a true fancier and bred to his Standard fowls? We should have a strain to be sure but one utterly valueless and unsalable.

The true effect of a good strain is to enhance the value not only of the originator's flock but of all other flocks made from it. What the breeder has been laboring for is increased excellence, not the production of offensive characteristics, and in proportion to his success in this is the popularity and salability of the fowls produced.

Apart from its inherent worth the judicously developed strain of birds is of great pecuniary value. What each purchaser wants to procure is first-class stock, not akin, and not only that but fowls of a special type possessing certain traits that have a breeding power. Some particular type or

style mutually understood by buyers and sellers is desirable, as an assurance that what is in the customer's mind when he orders is what the sender agrees to furnish.

The breeder who has for years aimed at no special point except the production of fowls that will score up to the standard eighty-five point requirement, cannot of course furnish any such assurance. For, though he describes what he has on hand quite clearly and spends time in detailing all the markings, he cannot give as full an image of the birds as the simple statement that he breeds unmixed J. Boardman Smith stock or some other well-known strain produces in the mind of any one familiar with that class of fowls. If it pays to breed any variety of fancy fowls as a matter of business, it most certainly pays to breed those which are not only first-class but belong to a well-known family.

The evils of constant in-breeding are so well known that it would be nearly labor lost for us to enter into a discussion of that subject. Every breeder who cares for the health and well being of his stock will desire sometimes to make a cross with another strain. In a certain sense all White Leghorns are related. They are a branch of one great family, and contain within their circle certain subdivisions. One subdivision of the great family may be notable for one valuable peculiarity, another for one different, yet very essential. Each strain may also have its peculiar faults, such as tendency to straw color, imperfect earlobes, etc. When two strains have been crossed, these imperfections are very liable to appear in the progeny in some form.

MANAGEMENT AFTER CROSSING.

After a cross has been made between two strains, with more or less reversion, what course shall we pursue? Some breeders would reply, "select the best of the pullets and breed them with their own sire;" and they assert that this mating will accomplish the desired purity of plumage quicker than any other method. Others would reject the first cock and procure another not closely related to him but from the same strain, thus striking with another hammer, but of the same kind. Breeding with a distant relative is undoubtedly preferable to the first mentioned plan, even if the full object is not attained in one year. Indeed, this need not be expected. This cropping out of "ancestral feathers" in some instances continues several years, necessitating the rejection of many specimens otherwise quite valuable. If the latter course is taken there should be great care exercised in the selection of the sire to be mated with the pullets. It is preferable that he be a *cock*, and one that has proved, in a previous mating, his power to perpetuate his color. Just so soon as the blood of one of the strains preponderates a similar ratio of improvement may be noticed, and in this way the breeder may obtain a valuable stock. Undoubtedly the same thing might be accomplished by obtaining a preponderance of blood on the side of the hens; but the cock places his impress on *many* chicks in a season, thus advancing the plan on a large scale.

BREEDING WITHIN ONE STRAIN.

Going on the supposition that the breeder confines himself to one strain in selecting his breeding birds, it becomes almost indispensable that a careful record be kept of the pedigree of fowls in the different breeding-pens. Otherwise there must be a liability to the identical evils which would flow from hap-hazard breeding. There can be no reliable system without this record. It is as unreasonable to suppose that a man can keep the relationship of his fowls in his head, as that he can keep the accounts of a mercantile establishment without books.

Let us suppose a case of mating where there is no record or knowledge of the breeding stock. The hens have been kept in common during the winter. The owner is advanced far enough in *henology* to know that it is necessary to breed from the *best.* He selects the best cockerel in the lot, and six companions. This cockerel's relations are prominent in the flock—1st, his dam; 2d, grand-dam; 3d, his great-grand-dam. These are all good hens. It might be owing to them that the cockerel has good qualities. Now for three more—1st pullet, sister; 2d pullet, sister; 3d pullet, cousin.

On the first day of February this mating is made, and on this day the flock is viewed with more scrutiny than at any time during the year, but the breeder selects the "good ones," without a thought of in-breeding. Such a course pursued from year to year will not give a steady uniform improvement. The person who makes such mating ought to be aware of what he is doing, so that in some future time

he may repent intelligently. This repentance cannot be exercised in full conscience unless the breeder keeps a pedigree record or has an extraordinary memory.

Every year thousands commence to breed fine poultry by purchasing a trio. Many of them drift into the method above described, or send off for a cock the second year—very probably of another strain. If they fail to rear exhibition birds, they wonder why! They would do better in the beginning to purchase two pairs (not near akin) instead of one trio, both pairs of the same strain, and thus breed two pens.

The next season a mating can be formed from the chicks produced in these pens, keeping a record of every bird fit for breeding; consigning all the culls to oblivion. The beginner should start with the intention of having several branches to his chicken family. These branches may diverge every year. The co-operation of a neighbor who is honest and careful, in this business of "branching out," should not be despised. When a nucleus has been formed, a few colonies in the hands of those who may be trusted, are a great convenience, affording, as they do, facilities for matching birds for exhibition or sale, and furnishing specimens for the breeding-pen of known pedigree and not closely related.

It is well, after the lapse of a few years, if the stock has given satisfaction, to go back to the breeder of whom the first purchase was made, and draw again from the old fountain. Sometimes an exchange may be effected with benefit to both parties. There should be so much care taken to preserve the distinctive characteristics of the strain

that the originator will feel assured from the first view of a specimen that he belongs to the "original Jacobs."

FACILITIES FOR EXERCISE.

Leghorns of all varieties are what the downeast skipper calls "considerable chipper and spry," and must have ample range or they will not do themselves justice. Ample range is rather an indefinite term and may be safely said to mean only opportunity to gain the full quota of exercise necessary to perfect health. To the man who keeps but one variety of Leghorns and has no neighbors with unprotected flower beds or gardens, the problem of gaining room for exercise is nothing, for his fowl-house doors can stand always open. But not one in a hundred can command such advantages, and the ninety-nine must enclose as large runs as the land at their command affords.

All runs, particularly the covered ones, which are needed for the fowls of this breed should be made of twine netting stretched on a light frame-work of two by two joists. A lath-built run is subject to many accidental damages which the netting sides would escape, and cannot be handily moved from place to place in search of fresh ground for wallowing, or tender grass for food. A run made of netting, can, beside its ordinary use, be rolled up, when the fowls are allowed free range, through the fall and winter, and thus be preserved from the rotting effects of alternate freezing and thawing. While it is off duty in this way, it may be limed or salted just as fish seines are ; or tarred.

Ground space is what all fowls need for exercise, and a run three feet high is ample for the largest crower ; so we

can at once save the extra material of building a high wall and make a far more sightly attachment to our houses when we use netting.

Leghorns will frequently lay well in a contracted space for a short time, but deprived of the room for exercise so essential to all breeds, and specially to this variety, they will, though laying fairly well, by no means do their best. It is better to build a house of small size, and unpretentious appearance than slight the runs, where the fowls pick up capital on which to declare dividends in the nest boxes.

In winter a supply of dry leaves is just the thing on the floors of the fowl houses in which to throw corn, oats, wheat or any other grain. The fowls in scratching them over to search for the grains occupy their time in healthful exercise which the frost and snow at this season of the year forbid their taking in any other way. Hens, like other bipeds, in order to be contented and healthy must not be idle. Their time must be taken up in the legitimate use of their drum sticks or they will be pulling feathers, eating eggs, or in some other mischief. Nothing is more natural for them than to scratch in search for their food, and we cannot do better than to allow them to follow their instincts.

EFFECTS OF CLOSE CONFINEMENT.

The breeding stock is necessarily under confinement in winter on account of snow and cold weather. In February the fowls are selected and penned still closer. Confinement usually prevents necessary exercise and deprives of natural food, especially insects and fresh grass. When the failure

in hatching is on account of non-impregnation, the cause may be the unnatural or forced condition of the male, affecting his virility. In order to avoid these evils one should know his condition. There is great reason derived from theory and experience both, that when embryo chickens are found dead in the shell it is the male element that is at fault. The deterioration of the health of the cocks through confinement and other artificial conditions of life is a source of great trouble. Sun, air, a variety of good food and not too much of it, and above all things *exercise* must be relied upon to keep your crower in good trim. It is not enough that he is eager and ready for his duties. He may not be in a first-rate, healthy, normal condition for all that.

What we have written on this head will, we are aware, apply to all breeds of fancy fowls, but pointedly to Leghorns on account of their great natural activity.

The non-sitting trait is as strong in White Leghorns as in any other non-sitting breed. Yet there may be an occasional broody hen in the flock, but in such cases the tendency is weak and easily broken up, and in any case not apt to occur but once during the season. Many hens of this breed, indeed much the largest number never show any signs of being broody, but after laying till they become somewhat exhausted take a short time to recuperate, then commence again. Exceptions are not uncommon, indeed we have known of pure White Leghorns sitting faithfully and hatching broods of chickens, when left alone without any disturbance during the time of incubation.

The breeder of White Leghorns must necessarily use

common hens for sitters, or keep a pure breed of sitters like the Plymouth Rocks to use for that purpose.

FEATHER EATING.

Among other vices to which hens kept in too artificial a condition are liable, that of plucking and eating each other's feathers is particularly aggravating. The agricultural journals are frequently beset by correspondents who are anxious to know what to do to cure this habit which their fowls have contracted. We have been amused at some of the prescriptions given in reply. One very large and influential journal said that the cause of the trouble is deprivation of insect forage, and the remedy is fresh meat, reasoning that that the habit is observed to be formed only in winter, or, if at other seasons, only when the birds are confined and so kept from a natural diet. Straightway minor prints seized upon the same idea, and we have been reading the same ever since. Meanwhile complaints did not cease, and another theory was started, viz.: that deprivation of fresh vegetable food was the cause, especially toward spring when fowls had been wintered chiefly on dry grain. And so raw cabbage was supposed to be a specific. There are statements in poultry books to the same effect, and claiming also peculiar virtues for lettuce as a medicinal diet, able to supply some element found in feathers, and to remove all appetite for the latter.

But we might as well try to extinguish flames by pouring oil upon them, as to cure feather eating by a flesh diet; and fresh vegetables, though excellent for other reasons, are

useless for the purpose under consideration. Feathers not wholly matured contain more or less blood in the quills, and form very choice morsels which will be greedily plucked and devoured by any flock of fowls, provided: first, that they can learn how, and second, that they afterwards have opportunity. The learning is invariably accomplished when fowls are confined in small rooms. Under such circumstances, if there is any mischief that can be invented, they will acquire it. A fowl in attacking a companion, incidentally plucks a feather, and, pleased with the taste, swallows it and seeks another. Now, in close quarters the underlings of the flock can readily be cornered by their superiors, hence the second requisite, opportunity, is gained. Hens are observing creatures and are especially on the watch with jealous greediness when they notice one of their fellows eating something. Consequently when one sets the example they all imitate, and in a few days they become a set of cannibals, eating each other like so many Kilkenny cats. A friend of ours had, a couple of years ago, a half dozen fowls in a small pen that not only stripped the feathers from each other till large patches of skin were bare, but pecked away the flesh also till considerable cavities were formed. Giving fresh meat or fresh vegetables will stop them just about as long as a noisy child can be silenced by gingerbread, that is, while its mouth is full.

In cold weather and during storms, when your fowls naturally huddle together in a corner, keep them scratching and pecking legitimately, as may be done by the exercise of a little ingenuity.

INCUBATION.

The best way to construct nests for sitting hens, is to place damp earth at the bottom packed to a concave shape. A square box is too angular, but earth may be readily molded to correspond with the shape of the hen's body. Damp earth at the bottom of a box serves another and more important purpose also. It is proper that eggs should be in some way exposed to moderate dampness during incubation, as otherwise too much of the water in their composition evaporates. A nest containing nothing but dry litter is not suitable, for all gallinaceous birds that nest upon the ground, expose their eggs in a state of nature to considerable dampness. Cover the earth with straw bruised until pliable and broken short, for long straw sometimes becomes entangled with the hen's feet, and thus eggs are broken. Straw cut with a machine we do not like, as the sharp ends are liable to prick the hen and the chickens. Hay should not be used as the seed it contains baits mice, and in some instances causes the hen to scratch to procure it to eat. The earth used as a foundation, should be rid of angle-worms, etc., for the same reason. The nest should be made enough concave so that the eggs will keep close together, but the sides must not be so steep as to cause the eggs to roll upon each other, and lie two deep. Some contrivance must be used to prevent chickens tumbling out of the nest as soon as the earliest of the brood become strong enough to stray from their mother. The ways in which this may be done are various. We prefer to use

a nest-box tight at top, bottom, and sides, but open at the ends, the latter being guarded by wire cloth, then as the chickens first appear, they are kept *in* the nest, and the rats *out*, while the hen is at the same time allowed air. We must keep lice away from sitters while they are confined to the nest for three weeks, continuously. This is an easy thing to do comparatively, in cold weather, as these parasites do not flourish so vigorously then as in the warmer months. But at *all* times, when the hen is upon the sitting-nest, in so far as this can be done, it should be carefully seen to that the patient, earnest mother of the anticipated brood of chicks shall not be annoyed with the assaults of these marauding body-insects.

When the sitting-nest is first arranged, if in a box, rub the sides with a wash of kerosene, and when the hen is placed upon her eggs, dust into her feathers some flour of sulphur, or carbolic powder — which will help to drive the vermin off at the commencement.

Then if you furnish the hens with handy conveniences for the daily dust-bath (in which they will always roll themselves) when taken off to feed, or when they voluntarily leave the nest for this purpose, they will keep their bodies pretty clear of lice during their confinement, and few or no nits will be found within or under the nests.

REARING CHICKS.

The White Leghorn chickens show their nature as soon as they get free from the shell. Activity and precocity are the peculiarities early apparent. There is a neatness and sprightliness about them which are very pleasing.

The chickens should be fed carefully, regularly, and with proper food. Indian-meal, scalded with hot water, may be the staple feed. After they are three weeks old, it should not be soft and sloppy, but dry enough to fall apart like properly boiled rice. A few crumbs of dry bread soaked in water or milk, bits of cooked potatoes, and often a few threads of fresh beef or veal may be scattered in the dough for variety. Where milk is plenty, take a pan of clabbered milk, pour over it a quart of boiling water, let it settle after stirring it well with a spoon, and give the curds once or twice a day to the young fowls. These, with fresh water twice a day, constitute a bill of fare that no well-bred chicken will object to or fail to thrive on. Not oftener than once in three or four hours, after three weeks old, do they need to be fed, as they help themselves to various tid-bits in the shape of flies and other tiny insects, and the constant exercise which the little chicks keep up during the day tends, equally with the food, to produce health, strength and growth.

It becomes a matter of great importance to arrange for the constant comfort and thrift of our early broods until they shall get to be sufficiently strong to bear exposure to the extremes of our early spring weather.

Some varieties are naturally hardier and will stand the cold much better than will others. *White* chicks (of any breed) are said by those who have carefully bred them to be generally the most tender, or most susceptible to cold. These then, need closer shelter, and more continual warmth in the chilly spring days.

But any variety or color of young fowls, until they drop

their soft down and put on the better protection afforded by their first feathering, must be accorded *warmth*, all the time—and complete exemption from our frigid winds in springtime—or they will inevitably droop, sicken, cramp up and die, in large proportions.

We now allude to the producing of chicks under hens, successfully. Where the incubator is used, provision for artificially warming and protecting them must be provided, until they become well feathered.

KEEP THEM ALIVE.

The getting out of chicks is generally considered the great work of the year—and justly so—but there is other and no less important work that must be performed in late spring and early summer. Getting out chicks is all well enough, and requires a good amount of acquired knowledge as well as much natural "gumption" and common sense, but the skill which enables us to rear the chicks from their helpless condition to the age of three months, is equally important.

We feel safe in stating that if half the chicks hatched out during the past year had come to a healthy maturity, the "chicken population" of the United States would be to-day double what it is. Plainly there is some influence of climate or surroundings or some slighting of the precautions that ought to be taken. That it is the latter rather than the former cause that has operated against the more complete success of the largest breeders seems highly probable, though a goodly share of failure can be laid to the attempts yearly made to raise great numbers of chicks in

cities and other places where pure air and clean soil are rarely to be found.

Wet feet send one half of the population of this country to their final resting place, we are told, and it seems worth-while to question seriously whether the chicks with their tender skins and newly formed members, are not as liable to take cold and suffer correspondingly from continued soaking of their feet in the sodden soil of early spring. We raise earlier chickens, as a rule, than our fathers did, and we do not have many of the great, old-fashioned barns that used to furnish dry, warm and sunny resorts for their chicks. To remedy the lack of such a place we must use our ingenuity and "sconce" to some purpose. Look at chicks at liberty on one of the spring days when the frost is coming out of the ground, and only here and there are patches of dry land, and see how each individual fowl tries to get the center of that spot of dryness. This ought to be a hint for special work in the way of preparing places for the young stock, which are theirs by right; and dry by nature aided by art.

Of course a certain percentage of chicks will be lost no matter how skillful we may be, or how perfectly we may carry out our schemes, but we firmly believe that the great bulk of all chickens lost yearly might be saved by judicious care in providing *dry* runs and keeping the birds within them. Freedom is an admirable thing for all fowls, but freedom at wrong times and in unhealthy places, is a short cut to the disease that comes as surely from damp ground and such sources as typhoid fever does from impure air and sewer gas. Keep the chicks alive, or rather, let them

live. Healthy chicks should grow to healthy fowls in a vast majority of cases, and if we will only perform our part will generally do theirs. Give them the best business chance in their line, and see if they don't make business in yours better.

CROOKED BREAST-BONE.

There are probably more fowls disqualified by malformation of the breast-bone, or keel, than almost any other defect. It seems a comparatively easy thing to construct perches broad enough to afford a proper hold for the feet of the chicks and thus obviate nine-tenths of the danger of crooking the keel while it is in a soft, almost cartilagenous state, but, somehow, it is not done nearly as universally as it should be.

In the worst case of crooked breast-bones we ever saw the whole trouble arose from the neglect of the breeder to provide any shelter for the chicks where they could rest in peace, unmolested by the older fowls. The natural result was that the chicks, like the "nigger" in the story, took to the trees, and following the instinct of all feathered creatures chose the higher and smaller branches for perches. Out of seven pullets picked from this flock, not one of them had a good breast-bone and in many of them the bone was flattened into a line parallel with the back.

One of the best plans for the avoidance of this evil is to train the chicks, beginning with the first brood, to repair nightly to a shelter, made for separate use, which has either no perches at all, or broad flat ones such as we have described. Such a shelter need not be anything very elab-

orate, a shed two feet high at the back and having a tight roof and sides is good enough. We need not even make any front for it, though a netting stretched across will keep out any skunks or cats that might fancy a meal of thoroughbred Leghorn. At the time of the year when the chicks have left the mother and set up for themselves it is so mild that anything that will keep off rain and dew is protection enough, and so this device will "kill (?) two birds with one stone," and while it secures straight breast-bones will teach the youngsters to roost by themselves and not crowd among the mature stock in its proper quarters in a manner equally vexatious to the fowls and their owner.

Carelessness is the prime cause of crooked breast-bones as of various other defects among our fowl stock, and, though the material agents differ, we can lay most of the blemishes we see to the lack of a little care bestowed in the nick of time.

WINTER CARE.

When we talk with breeders of White Leghorns, and mention the objection to them, sometimes made, that they are not winter layers, the reply is always ready "No fowls ought to be exposed to severe cold in winter, and if Leghorns are as well protected as all fowls should be in winter they will supply a reasonable number of eggs."

There may be truth in this remark, yet taking things as they are, we find most of the poultry-houses in our northern climate, not frost proof, and we know that Leghorns will not lay in winter if kept in very cold quarters. They should be kept in very warm houses.

Among those who have not the proper buildings in which to winter their Leghorns there is more or less complaint of the freezing of combs and many have their sympathies aroused every winter by the sufferings which their Leghorn cocks undergo from the freezing of their wattles; to say nothing of the disfigured appearance they present after recovering from its immediate effects unless they are fortunate enough to succeed, by unremitting care and attention, in saving them from lasting disfigurement. The freezing is occasioned, as those who have had the experience know too well, by the wattles of the fowls dipping into the water when they drink. How to keep the wattles out of the water is the question; and one usually considered difficult of solution, yet all that is required is to give them their water in a vessel which will admit the bill only, and not in a shallow broad dish as is too often the case—if such vessels would have a cover with a hole in it *near* the edge so that the bill might enter and reach the water and the wattles fall down out side of the dish the trouble would be overcome.

Winter is the most trying part of the year to young and adult fowls. The bleak winds that moan through the leafless trees like a funeral dirge, warn them to keep under shelter. The cold crispy snow that fills every spot of their favorite runs, hinders them from enjoying their accustomed exercise. Worms, seeds, insects and grass are either covered or hermetically sealed, until the warm sunshine of spring opens the pores of earth again.

The first cold spell that immediately precedes winter, is the most trying to fowls. The sudden cooling of their

bodies through the air cells, which are sore and tender after moulting, tends to check the secretions, and often predisposes them to ills of the worst kind.

We must remember that winter makes sad havoc among fowls that are not comfortably cared for, colds, catarrh, influenza, which are generally stages of roup and inflammatory diseases arising from one or the other will often prevail when they are exposed to cold storms, "roughing it" about manure heaps, and wading through slush and snow to find a sunny spot to huddle on. This condition will not tend to egg production; and under it White Leghorns will utterly refuse to lay.

Winter is the season that our fowls should be comfortable. It will pay us to bestow a little of our time in stopping up the chinks, glazing the windows, and preparing those little extras they need during confinement—such as ground bone, oyster shells, lime, gravel, cut hay or clover heads, and charcoal to aid digestion and assimilation, and also to furnish material for shells.

Now, "an ounce of prevention is better than a pound of cure." If you want your fowls to lay and do well, they must be well fed and warmly housed. There are some who will tell you that nature seals up in winter the egg functions as it does the earth in frigid climes, and do as you will, your fowls will lay only a certain number of eggs anyhow. This theory is illogical—hens will lay in winter just in proportion to the quantity and quality of food consumed—the temperature of their houses and surroundings—and the due observance of cleanliness, exercise, ventilation and the avoidance of over crowding.

Domestication, and pure breeding have made fowls in many ways subservient to the will of the breeder. They have become voluntary egg machines, and when the proper principles for the production of eggs are applied, they will steadily and satisfactorily perform those special offices for which they are so highly prized.

Winter is the time when eggs are dearest. A dozen laid then is better than three dozen laid in spring-time, because you receive double price for them in the first place, and your laying fowls do not consume as much food while laying a dozen in mid-winter as they do while laying three dozen in early spring. These facts are patent to all experienced breeders, therefore, it is to your advantage to take good care of your fowl stock, especially when cold weather sets in. Avoid the foolish practice of crowding fifty fowls into a house that has not capacity for twenty.

DISEASES.

The diseases that White Leghorns are most subject to are Roup, Canker and Consumption. They are not long lived. They live fast, and by this we mean they are so active and precocious, and such prolific layers that they exhaust their systems and are thus made vulnerable to attacks of diseases, particularly Roup.

This insidious disease is the most prevalent that fowl flesh is heir to. It is not solely confined to any particular breed, locality or season. It assumes many types and phases from its incipiency to its termination, according to the stamina, health, care and surroundings of the cases affected.

Roup commences in the beginning with symptoms of languor, drooping, moping and loss of appetite, soon a dry cough is heard, followed by a shrill wheezing. The throat becomes very much swollen, the eyes watery, and a foul, yellowish slimy discharge exudes from the mouth and nostrils superinduced by ulceration and inflammation of the mucous membranes, soon this muco-pus extends to the tongue and roof of the mouth which completely obstructs the nostrils and prevents respiration through them. Patches of this muco-pus deposit become encrusted upon the mouth and beak, causing the fowl to gape, wheeze and shake its head in its efforts to breathe and throw off this offensive deposit which now fills up the extended portion of the wind pipe. Frequently the sight is affected by the virus of this muco-pus matter coming in contact with the mucous membranes of the eyes by the bird thrusting its head through its feathers, or by its attempts to dislodge with its feet the yellowish crust upon its nostrils and beak.

This loathsome malady not only effects the throat and head of fowls, but in a neglected or an advanced stage their bodies also. On dissection, the gall, bladder and liver are very much enlarged and full of pus. The meat is soft, slimy and spongy,—particularly about the breast and region of the lungs, and the flesh has a disagreeable smell.

We have described this disease somewhat minutely. New beginners and poulterers who have had little or no experience in this malady, will find much information and be able at a glance to detect its symptoms before it has run its course. Now we will mention some of its leading causes :

The incipient stage of the disease differs not much from what most people would call a *cold.* Fowls are most liable to an attack of roup in fall or winter. Having been accustomed, during the mild weather of autumn, to roam at large and enjoy the mellow sunshine, breathe the pure air, and take advantage of every circumstance which is conducive to health, they are, perhaps suddenly, subjected to a change; the cold rains come on, and chilly winds pierce through the feathers of the adult fowls, not yet through the season of moulting. They follow their accustomed bent, plodding, picking, wading in cold water, till they are completely chilled. This happens, too, when in many cases their systems have been somewhat exhausted by constant production of eggs for many weeks.

In some cases the birds are confined in low, damp places, or where they are exposed to cold draughts of air; and in many instances they are shut up in small places, packed like sardines in a box, without sufficient ventilation, making a regular hot-bed of disease. Besides these causes, very sudden change of temperature, exposure to snow storms, impure water, cesspools, decaying vegetable matter, tend, either simply or combined, to predispose fowls to roup.

Now, we earnestly recommend preventive measures as the surest safeguard against this noxious disease. Don't expose your stock to the inclemencies of winter. Fowls that are warmly housed cannot bear to "rough it" outside. Provide ways and means for daily exercise, and always keep on hand a box of *German Roup Pills*, to "nip the evil in its bud."

When fowls begin to droop and lose strength and appetite without any visible symptoms of disease, it is time to look up the origin of the debility and apply prompt measures to recover the tone of the system and restore the appetite. Sometimes it will be found that birds thus attacked have been unduly excited and worried when on exhibition; sometimes the trouble is occasioned by extreme fright which operates on nervous birds in the same manner as on nervous people; causing indigestion, disorder of the liver and a general falling off in symptoms of health. Nothing is better to restore the "tone" of such birds than quinine and iron mixture. When amendment begins to take place give a little cooked meat and omit all medicine, except, perhaps a little of the tincture of muriate of iron in water, which will operate favorably on the blood and consequently on the general health of the fowl.

FLANNEL HOOD.

Every person who keeps Leghorns should have a house for them so constructed that their combs will not freeze in the coldest weather. But in case the building is not suitable, and extreme cold comes on suddenly, rather than suffer loss, it may be worth while to make hoods of flannel to protect the combs. Cut two pieces a little larger than the comb and of the same general shape; sew them together on the upper part, draw the hood over the comb and fasten it with a gathering string or a rubber cord passed around the base. A throat-latch may also be used if necessary. This suggestion may cause a smile on the part of some readers; but we have in mind *valuable exhibition fowls* and

the emergency of sudden change to a low temperature continuing several days. To save such fowls from discomfort, disfigurment, and the owners from loss it may be worth while to spend a little time in thus affording temporary protection. We have seen valuable Leghorns ruined in appearance, by passing one cold night on the way to the show room.

In such cases to provide a slight covering of flannel for comb and wattles would not only prove economical but merciful.

PREPARING FOR EXHIBITION.

All white fowls acquire by exposure a red or yellowish tinge, whereas a "pure white" is the Standard requirement. The means of accomplishing the necessary whitening are within the reach of every one, and consist of a thorough washing and drying. Not only do White Leghorns need as careful washing as can be given preparatory to their shipment to the show, but they may receive an extra degree of gloss on their plumage if a handful of powdered borax be added to the water of the bath. English breeders sometimes sponge the feathers gently with salad oil and this is a good enough plan, but its chief advantages come soon after the application, as the oil is liable to fade out after a day or two and leave the feathers duller than before. Single comb White Leghorns (the standard variety) should have special care given their combs and wattles, to ensure their appearing at their best.

As with all colorless fowls the chief points of notice after symmetry and condition are the parts about the head

—the comb, wattles and ear-lobes, and the legs and feet. Five or six points are set as the number for the comb and five is preferred. We have been steadily working down from a great number of small points to a definite and much smaller one of better and larger serrations, and with the great success breeders are having in bringing out for show purposes the "five preferred" specimens, there seems to be no obstacle in the way of making a comb of five points the only standard one, though a cock with a six pointed comb is not cut in scoring solely on that account he cannot win over a competing bird of equal excellence and a five point comb.

The wattles as well as the comb should be smooth and velvety to the touch and perfect in shape. The ear-lobes must of course be white,—but there are very different kinds of white—and the winning sort is not always easy of obtainment. There is a thin, scrawny style of white which looks as if stiff paint had been hurridly laid on and a slight washing would bring out hidden red,—of course a poor style of beauty. Even the best ear-lobes can be bettered by judicious treatment such as we have never seen desscribed, though various methods are in quite common use. Visitors at the best shows have seen occasionally the perfect ear-lobe, that looks like snow in its purity and like cream in its smoothness or like the smooth icing of an elaborate cake, but how many can tell how such a result was reached. The chief agents employed in this process we propose to relate. First comes *spiritus fermenti*, or in vulgar parlance whisky, which is applied in dilute form with a soft sponge or a rag. Second on the list is spirits of turpentine which

can be applied in the same way; and third is oil, salad or sweet. All these serve not only to clean the skin but as invigorators, yet have an evanescent effect and must be applied again and again during the show to keep the tone of the parts up to concert pitch. Right here let us give a hint on a matter that has puzzled many amateurs—the tendency to the appearance of red spots in the ear-lobe on the second and third days of the exhibition. This is owing simply to the necessary caging together of the two sexes. If the males are kept separate from the hens a few days before going to the show, the ear-lobes will whiten perceptibly and will hold this added perfection some time.

The Legs of all varieties of Leghorns should be a rich golden yellow.

SENDING TO THE SHOW.

Washing the fowls generally is done the day previous to the one on which they are to be sent to the Express company for transportation to the show room. Supposing now that our fowls have become nicely dry over night and the feathers webbed to our satisfaction, we are ready to attend to their proper caging and shipment. The common method in this country is to use a clean box—an old shoe case, or something made of new stuff that has no rusty nails projecting inward will do; next a tin cup to hold corn is nailed to one side about four inches from the floor, to place it out of the reach of droppings and anything scratched from the bottom of the box as well as to prevent its upsetting. If the fowls are to travel a long distance so that twenty-four hours, or more, must elapse before they reach their

destination, a second tin is put in the opposite side with facilities for filling it with water, and a card attached requesting express officials to water the fowls where they lie over night in the station. No water should be put in this second tin at the start, for, though the weather may be comparatively mild, the nights may be cold, and all fowls, the Leghorns and Spanish particularly, will be quite liable to freeze their wattles, and thus seriously injure their chances of winning, to say nothing of their discomfort and the liability of incurring roup and kindred diseases.

When we have put in the appliances for feeding and watering to our satisfaction, and have provided a litter of clean straw, we are ready for the fowls. Next comes closing the box. We prefer fastening on the lid with scews to making a trap-door which can be raised by any one who wishes to inspect the fowls *en route*. For, though it rarely happens that any one is despicable enough to injure a fowl wantonly, it does no harm to guard against all possibility of danger. To secure ventilation, the top of the box should be made of strips, set about an inch apart. On no account, if the weather is cold, should there be any openings in the sides or bottom. Draughts of chill air are more harmful to fowls of any breed, no matter how hardy, than any full exposure and we must guard against them.

With such a box as we have described, the fowls should go safely for quite long distances, and be as fit for competition as those bred in the town where the show is held.

For the benefit of those who may like to try it we will give a brief description of the English method of shipment. The prevailing carriage, across the water, is a stout wicker

basket, something like the ordinary waste-paper basket of our offices but closer woven. For large fowls which are generally sent singly, a hamper about two feet in diameter and of equal height is used, and for fowls of the smaller varieties cages of the same shape and structure but of proportionate size. With the hamper Wright advises sending instead of our supplies of corn and water a fresh cabbage head securely fastened to one side of the cage and a loaf of bread attached to the other. In such a case the bread should be moistened with ale or some rather stimulating fluid. Packing eggs for shipment in baskets is fast coming into vogue in this country and it is not unlikely that hampers for use in sending fowls to the shows will gradually be introduced and become popular when fowls are not to be sent long distances.

Whichever method of shipment we adopt it is very necessary that we give the birds ample space to turn and walk a few steps without bending the tail-feathers to one side. We need not give them "space enough to swing a cat," for, presumably, like Mr. Dick they don't care for that kind of exercise, but they must have room to turn safely, for turn they will without regard to their owners' wishes.

At the Columbia county (N. Y.) poultry show in the season of eighteen seventy-seven and eight was a White Leghorn cockerel that ought to have scored high,—for he was the pick out of a flock of forty birds reared from the late M. S. Strong's unexcelled stock,—but was disqualified for a wry tail. When he left his owner's yards in New York state he was all right, but by the ignorance of the person who put him in a box that just contained him and left no

room for turning he was ruined. The wry-tail he thus acquired was probably merely a trick of carriage and could be made straight by the use of a little care but it was amply sufficient for destroying his value for that show.

Though the larger fowls, the Cochins and Brahmas are not so liable to suffer in this way as the Hamburgs or Leghorns, we must still take precautions in their shipment as much as in that of the latter. To determine whether the box is large enough for its duty—if we have any doubts on the subject—place the fowls in it and make them stir about a little. Then if they seem to brush hard against the sides when they turn take them out and get a larger box.

We have already said, use a clean box, and we now add as postscript the hint worth attention, get a neat one. If our birds are to go in good shape, the outward appearance of the package that holds them is of great importance, for on the respect it inspires in those who forward it, rests its careful handling. With a neat, clean box securely fastened and fitted up as we have described, we can safely trust our fowls to the Express company and feel secure in meeting them again at the exhibition hall in good condition.

Poultry World.

THE

BROWN LEGHORNS

HOW TO

MATE, REAR AND JUDGE THEM

BY H. H. STODDARD

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PREFACE.

No apology in this preface for publishing a book on Brown Leghorns. Where there is a demand for anything in the commercial world, the supply comes on apace. An intelligent class of American fanciers demands of us a book. How can we refuse? People are asking a thousand questions. It would be hard-hearted and impolite to return no answer. This book is intended not to fill the place of an umpire in disputed points, but to answer the purpose of a chart by which a beginner may be guided in breeding Brown Leghorns. Let every tub stand on its own bottom.

THE BROWN LEGHORN.

ITALY has furnished to the American fancier a breed of fowls which stands alone among poultry and contests very successfully the place of prime favorite.

This fowl is known as the Leghorn, rather than as the Italian, from causes much the same as those which led to the several names applied to the Asiatics. Each fresh importation brought a new name, and Shanghæs, Chittagongs and Burrampootras in their turn led the list of favorites among those who were affected with the "hen fever.' In this way it happened that Leghorn, as the port most accessible to American ships and doing the largest business with the United States, gave to the fowls which our vessels brought from thence, their name. Prior to their purchase at that place, nothing was known of their history.

If we could trace the fowls of the first importation as clearly as we do our own pedigreed fowls of today, we might find that Paduan was a truer cognomen, or that they were gathered from widely separated points of the flat, low-lying country between the coast ranges. Though the inquiry would be one of interest, it could have little

effect on the question of the purity of the Brown Leghorns bred today by our most skilled fanciers.

To us the origin of the name is not as interesting as the origin of those peculiarities which distinguish this breed. Color of plumage may be nothing remarkable. We have the white, black, brown and dominique. These colors, on domesticated fowls, without care, would be mixed in many specimens, and the Leghorn would really be a speckled fowl. But who has not observed in flocks of native fowls that have been bred without any choice of color, how, in a few years, the red-hackled cock appears, with the black breast, and the "brown hen?" This seems to be a natural arrangement of color when breeding for color is not an object of attention. Hence it is reasonable to suppose that the Brown Leghorn, in its native clime, may have the most natural color among the black, white and mixed.

The doctrine recently advanced by an eminent writer on poultry that all breeds of fowls tend to grow *lighter* in color may be decidedly pronounced erroneous. If this were the case, then on farms the flocks bred hap-hazard style would all have become snow white long ago. The truth is, domestication causes the color of pigeons and poultry of all kinds, in common with horses, dogs, sheep, cattle, and all other domestic animals, to scatter in all directions. There is a constant tendency toward white, black, brown, yellow, mottled, pied, brindled, spotted, "ring-streaked, speckled, and grizzled." But there is no more gravitation toward light colors than toward dark ones. Black sheep appear persistently, in spite of continual weeding. White and black horses start up in a strain of

bays. No matter what the uniform color of a race of birds or quadrupeds is in a state of nature, domesticate it, and, owing to a change of food, or to some unknown cause or combination of artificial influences, the stock branches out, in a few generations, to a great diversity of colors. Now, with fowls there is not only a constant tendency to this scattering of color, but also a conflicting tendency to the reversion to the primitive type of the *Gallus Bankiva*, the parent wild stock, which is colored very much like our *Standard* Brown Leghorns of today. Therefore the persistent appearance in the barn-yard fowls of Italy of the Brown variety of Leghorns among black, white and speckled specimens, is but the assertion of the original tendency of the race, and the brown type of Italian fowls with black-breasted males may be looked upon as carrying the inborn marks of their ancient lineage.

But, what produces the shape, and the lithe and lively qualities? There is a "blue blood" and a fineness about this breed which we may best account for by the *climate* where they have lived for ages. What makes the difference between the quick, impulsive Italian and Frenchman, and the native of northern Europe? Is it not the long-continued direct and indirect influence of climate?

But, besides the influence of climate, what naturalists call *correlative development* has much to do with it. By this term it is meant that the growth of one part of the body of an animal affects the growth of other parts. Now what can we expect of a small or medium-sized fowl like the Brown Leghorn hen? Surely not meat enough to fill the stomachs of a large family at dinner! She flies around lively and cannot, of course, lay on flesh. She is enter-

prising, and her very lightness and quickness render her able to go farther in a day, and, if at liberty, get a proportionately larger share of good things, as worms and insects, to make her lay eggs. While she is doing this, a specimen of some larger breed will hang around the barn or shed, eat corn, lay few eggs, but develop a body amply sufficient in bulk to dine a company of six men.

There is a balancement in growing things. If nutriment flows to one part of the organism, another part must go lean. The cow that makes two pounds of butter per day will, very likely, present a body of skin and bones, after she has been at it a considerable time; while the Short Horn, with ample proportions, bones well hung with fat, gives but little milk, with but few oily globules. We never see a crest accompany a large comb, or find a beard and large wattles on the same fowl. A little crab apple will have an abundance of seed in perfection. A cultivated apple, large, luscious, well flavored, will have few seeds, and a portion of those in a state of atrophy.

Some one may ask if the sunny clime of Italy will cause monstrous combs to grow on fowls. We answer that the tendency of a cold climate is to make the combs small. Men living in a cold country will select specimens with small combs as breeders, for the reason that large combs will invariably get frozen. But, in a mild country, a large comb may be cultivated, also those of curious or fantastic shape, as in French breeds.

There is a tendency among mankind to admire some extraordinary development, or something very small. It is not unreasonable to suppose that the Italians, away back to the time of the Roman Empire, if you please, *cultivated*

these high single combs and large wattles. Women care for poultry, to a great extent, in Europe, and these extravagant combs are of a piece with hair fixings sixteen inches high, hoops four feet in diameter, and shoes with heels stilted.

It can not be denied that the people of a nation producing many artists will be very likely to select and breed domestic poultry with taste, and with an eye to the beautiful. Who does not think that the combs and wattles (not frozen) on a Leghorn fowl are very pleasing?

But, however much or little the premeditated *selection* of the keepers may have effected in the matter of combs (and we are inclined to suspect that it has accomplished a great deal, not so much in originating the large combs as in perpetuating and intensifying the trait), the law of correlative development has come in play here also, no doubt, working slowly, but surely, for ages. They have small bodies and can afford to have large combs and full large tails. No doubt man has much to do with this, but nature fixes these things so that they are suitable, and it is not difficult for man to fall in and help a little. How the Leghorn would look with a small comb and a Cochin tail! Intolerable, even with large egg production. It is easy to believe that a large body naturally has with it proportionately *small* appendages; so that when we get a fowl with a large, thick-set body, the tail and head fixings are small, not entirely through man's interference by selection.

We can give no reason for many things in nature but that *they are so.* Many other things are very plain. For instance, a wild dog carries his small ears erect, because

he must listen almost constantly, in his wild condition, in order to get a living; but generally the tame dog has large lopped ears, because he is free, in his tame condition, from the necessity of constant watching, and the muscles of the ear become lax by disuse. *Use* has much to do with development. Note the muscles of the blacksmith's arm. The Brown Leghorn has large wings. Why? Activity accounts for it; also, in a measure, for the size of the tail. Watch one of this breed and you will see the head move quickly and often. Does not this cause rapid and full circulation of blood, and help to develop large comb and wattles?

THEIR HISTORY IN AMERICA.

Turning from the meager record of our first knowledge of the Leghorns on their native shores, we may investigate their history in the United States with more satisfactory results. The story is, to be sure, pretty familiar in many of its points, to the veteran breeders of the last quarter century, but as it is absolutely necessary to the thorough understanding of the subject, we give it as concisely as possible.

Briefly, then, about 1835 (the exact date is unknown), Mr. N. P. Ward, of New York City, received direct from Italy a few Brown Leghorn fowls, which, in his hands, undoubtedly proved their claims to superior merit; for, though he wrote nothing which has been preserved about them, he gave eggs and fowls to his friends, one of whom was Mr. J. C. Thompson, of Staten Island. Mr. Thompson was greatly interested in the breed, and gave an account of their marvelous precocity and early fecundity, which

was similar to the characteristics of the fowls now bred. The pullets matured and commenced to lay at the age of four months, and, though we have no statistics of the male side of the house, there is little doubt that the cockerels showed as early development as the pullets.

At a subsequent period Mr. Thompson, who seems to have been a most enthusiastic fancier, sent by his son-in-law, who was a sea-captain, for an additional supply of the fowls, and received birds that had the same markings as those first imported, and exhibited the same precocity. In a letter published after breeding them several years, and when the fresh blood of various importations forbade the idea of deterioration through too close in-breeding, this pioneer breeder expresses the opinion that pullets frequently laid themselves to death.

For some time after this, however, there was little known of the fowls, and when, in 1852, they made their entry into Mystic River, Conn., not one poultry breeder in a hundred knew what they were, or what were their peculiar merits. They speedily learned the latter, however. The following year a second lot of birds arrived in Mystic, and were distributed among the friends of Captain Gates and the first officer of the vessel, Mr. Morgan, who still lives in the town of Groton and corroborates the details of the importation. From this time the dissemination of the breed was very rapid, and its popularity advanced speedily all through New England, where it was known as the Red Leghorn.

Beside the importations we have spoken of, there were, undoubtedly, others which helped fill the demand for the breed, but no record of them was ever published.

GENERAL CHARACTERISTICS.

In the importation of which Mr. Thompson has told us, the chief peculiarities of the fowls, as far as points of shape and color were concerned, lay in the extravagant size of the combs and wattles, and the rich cinnamon plumage of the females, which was a novelty to American breeders. One hen, whose development in this direction was probably not far in excess of that of the rest of the flock, had a comb six inches high (actual measurement), and extending so far out over the beak that she was obliged to press it to one side before she could pick up her food.

The fowls which came to Mystic in 1852, and the subsequent year, were not so cumbered with overlapping combs, but were still sufficiently remarkable in those points which had excited the surprise and admiration of the Staten Island fanciers. We have ourselves seen, within a year, the direct descendants of the 1852 importation, which have been bred in a direct line, and though selected from year to year with an eye to reducing the superabundant growth of this member, still show combs, in a number of specimens, that will measure fully four inches in height, and which lap over the eyes in a way to render one of them unavailable for seeing anything but the pendant comb.

Apart from those points of difference from all other breeds which we have spoken of above, the Leghorns, in all their ways and actions, show their strong individuality. An active fowl of this variety, when left to the unfettered exercise of its natural proclivities, is as near an embodiment of perpetual motion as can be found among poultry

But this activity is not of the useless sort; it represents, every step of it, some action for the fowl's advantage (and the owner's as well). If we watch one of these birds and note how constantly it feeds on the worms, grubs, and whatever it fancies, we shall no longer wonder at its feats of egg-production, but shall begin to see that there is method in its operations.

It is easy to understand, if we only think of it, that extraordinary production can only come from unusual forces, and that to lay twice as many eggs per year as a common mongrel hen, the pure Leghorn must have, not twice as much food, but the exercise which enables it to keep all parts of the complicated structure in healthy working order.

Activity is as clearly a trait of the fowls of this breed as quietness and docility are of the Brahmas, and just as these habits in the latter qualify them for their duties as mothers, the nearly opposite ones in the Leghorns fit them for their place as the most prolific layers of all domestic fowls.

CAUSES OF PROLIFICNESS.

A topic of great interest to the thoughtful poultry keeper is the origin of this trait, the discussion of which will lead to an understanding of the methods of maintaining and even increasing the laying qualities. We shall find as we proceed that the prolificness of Leghorns, or of any other breed, has been the work of time, and that most of the work of producing great layers has been accomplished outside of the class of poultry fanciers, and, in a great measure, without the persons who did it knowing or caring what they were doing.

Every species of wild bird produces an invariable, or nearly invariable, number of eggs for a sitting. This number is that which is calculated to produce the most young capable of being reared. The robin lays from four to six, because this number can be covered, hatched, and the progeny reared in a nest adapted to the size of the bird. Those robins who might, in the course of the variations that appear at intervals throughout all nature, produce only two or three eggs, leave so few descendants that they would become exterminated by rapacious enemies. Just so those who varied in the opposite direction, and laid seven or eight eggs, would leave very few descendants, because the eggs being piled upon each other would not hatch well, or, if they all hatched, the brood could not be all reared, and not so many young robins would grow to maturity as if the advantageous number of four to six were laid and hatched. By perpetually cutting off unfavorable variations, nature culls the fittest, and perpetuates the exact laying habit which is best adapted to cause the animals possessing it to leave descendants. Now what we have said of the robins applies to the wild jungle fowls, the parent stock of our domestic races. The wild fowls were compelled, by the inevitable workings of nature's laws, to produce about fifteen eggs for a sitting. If the matter was overdone, and several more were laid, the hen could not cover them sufficiently, and fewer chicks would be reared in consequence. Too few eggs would lead to the same result. The degree of laying that would make the greatest increase of grown-up birds would prevail one year, and the next, and the next, and keep prevailing, till it became "fixed," as a poultry-breeder would say. Nature

selected the best habit and fixed it till it became a hereditary trait. Again, those birds who reared two or more broods in a season, and those who possessed the trait of laying to replace eggs stolen by predatory animals, would leave the most descendants. There are many causes perpetually operating to thin off birds in a wild state, and those strains which produced the fewest chickens would become exterminated sooner or later. Life is a conflict. Nature must "breed to" a "standard," and that standard is always simply and solely based on the test of *increase.* She cares for nothing else. Only the strains that rear great numbers of young can be preserved; for the jungle fowls, like all the races of birds that are juicy and toothsome, are beset with devourers. It is prolificness or extermination. The laying habits are thoroughbred, and bred *very* thoroughly. Nature had plenty of time in which to form her breeds and lay their foundations deep. She was breeding fowls to a certain type, as respects laying, for many thousands of years before domestication began.

We come now to the period of the domestication of fowls when man's influence commences; that is, we pass from natural selection to *artificial.* Rather, the selection under which poultry is modified after man has a hand in the matter, continues to be partly natural and partly artificial. The laws of nature are not set aside when he domesticates fowls; the case is only complicated by the introduction of new factors. One of the most obvious influences that begins to operate upon the laying of tame fowls is the profuse supply of food. The period of plenty is not generally continuous in the wild state, but man makes spring and summer extend the year round, as far

as food is concerned. This induces a habit of plentiful laying that becomes hereditary. The effect of a generous diet upon egg production, every poultry-keeper knows too well to make it necessary to enlarge upon this point.

Another means by which the laying of tame fowls has been increased, is the gathering of the eggs as fast as laid. The predatory animals that devour eggs are mostly got rid of when the fowls are brought to live with man; but he systematically plunders in their stead. Stealing eggs from hens by animals of prey, or by men, causes them to lay more in their place. Now, under domestication, robbing hens' nests is carried on so regularly and constantly by men, that the production of eggs is stimulated at a great rate, while the abundant artificial supply of food gives the materials. The work of breeding strains of fowls to be great layers by gathering their eggs daily, was not performed with any conscious purpose. The keepers simply took the eggs because they were wanted, and carried on the practice without knowing that the race would become changed by that means.

Another potent element has tended to increase laying. There is what we may call a *mathematical* reason why tame hens should, in process of time, become bred to a type of great prolificness, even without any design on the part of their masters. Let it be borne in mind, that laying capacity, like every other trait, is hereditary, and that it varies in different fowls. Now, our ancient poultry-keeper, ages before Babylon was built, goes to the nests of his tame fowls, and collects eggs from old Browny, old Speckled, old Scratch, and all the rest, and lays them by till wanted. Some are eaten, and some remain till our

Ancient, or his wife, takes a notion to set a hen, when a dozen or so of the stock of eggs are selected. Of course, the most prolific hens contributed the greatest number to the hoard, and, by the same token, they furnish the greatest share of those that go to the sitting hen to be hatched and reared. That is, the keeper is *unconsciously selecting* the eggs produced by the best layers, and is thus improving his stock in laying qualities, year after year. In other words, through the mathematical order of things, the most careless and indifferent poultry raiser is, whether he knows it or not, continually breeding his fowls so as to increase their rate of laying. This blind mathematical law, that the hen who lays the most stands the best chance of having her eggs set, must have operated from the earlist domestication, and continues to operate. It has done more to create and improve the habit of great laying of our fowls than all the poultry shows or poultry books and journals that ever existed, or ever will exist. When man has not been trying to improve poultry, he has improved it most effectually.

But man has not always worked *unconsciously.* There is a premeditated selection that he has carried on from remote ages. Hens have been made pets of, and noticed closely. The eggs of favorite fowls have been observed, and the keeper has learned to distinguish them from the rest. In ancient rude times, the fowls would make their nests in the hut where their owner lived. In modern days, poultry lay in or near the cottagers' dwellings and in the woodshed of the farmer. Under such circumstances the best layers become known. The inmate of the hovel or cottage, or the farmer's wife, says, when culling eggs to set,

"This is old Browny's egg. She is a good layer. I like her breed. I guess I will pick out her eggs." This method of proceeding produces a wonderful effect in the course of many years. It is not pretended that all persons who keep or have kept fowls, for some thousands of years, have selected eggs to set in this way; but if a few here and there, scattered all along down the centuries, have done it, the accumulated results of these selections have greatly increased prolificness. The effects of a single act of selection are not necessarily lost because not followed up the next generation. Selections may occur only at intervals, and yet have an important influence.

The next cause operating to increase laying, which we shall mention, is the transportation of poultry to new countries and strange climates. Whatever gives a severe shock to the system of an animal, may operate at once upon the reproductive organs. Bring fowls to this country from India, Japan, Germany, or any distant land you please, and they will exhibit, for a number of generations, a tremendous rate of laying. This will happen whether they are brought from a warmer or a colder country than our own—from northern Russia or southern Italy. We claim to be the first, so far as we know, who have spoken of this influence operating upon fowls. Brahmas and Leghorns did not arrive at the renowned prolificness which characterized the first imported specimens, through any studied breeding such as is practiced to produce fancy points. It happened incidentally, by the mere shifting to a strange climate. The unaccustomed influences poultry are subjected to by importation are not necessarily salutary to their constitutions. The fact that laying is increased

shows rather that their stamina is threatened. Their vigor receives a blow, and their vitality rouses to repel it. It is as if nature said, "The race is threatened with extinction; let unusual prolificness be resorted to, to ward off the danger." A plant, gradually killed by pruning the roots, or animals affected with certain diseases, will, in like manner, produce seeds or young in unusual numbers while life lasts. The shock of a new climate and strange atmospheric influences is not so violent, of course, when fowls are imported, as to actually cut off the race, but it is powerful enough to give reproduction a noticeable start.

To summarize what we have said, the principal causes which have made our fowls great layers are, an abundant supply of food; the daily removal of eggs; the mathematical law that the hens that lay the most will have, in the long run, the greatest number of their eggs set, apart from any design of the owner; the selection of the eggs of prolific fowls, on purpose; and importation, by which the reproductive organs are stimulated. All these causes, put together, have been in constant operation, excepting the last, which is, in its nature, temporary; and the accumulated results have been wonderful. The change from thirty or fifty eggs per year to four or five times the latter number, did not take place in one year, or a hundred, or a thousand, perhaps not in ten thousand. There is every reason to believe that hens have been kept from a very remote period in Italy, and that long before any historic races of men inhabited the shores of the Mediterranean the jungle fowls were domesticated by the Asiatic progenitors of the peoples who migrated successively to Europe.

MATING.

Leghorns which are perfectly matched in the show pen come nearer than fowls of almost any other breed to being properly mated for breeding purposes. Not a few breeders declare openly that there should be no breeding stock which is not also fitted for showing; and if they wish to breed a good general average of chicks of both sexes, we are willing to admit the truth of their statements. There are, however, certain circumstances under which the breeding of birds paired for exhibition will prove very poor policy and result in a far poorer average than could be obtained by the use of a little forethought and the proper mating for the accomplishment of specific objects.

All Leghorn men are familiar with the tendency of the combs of cockerels to lop to one side and cause disqualification, but few apparently see the necessity for mating their breeding stock in a way to avoid the appearance of this defect in the next year's chicks. Looking at it as we would look at the mating proper for a light hackled Light Brahma, we see plainly that in each there is a deficiency which indicates that they should, by the law of compensation, be mated to fowls possessing very strongly what they lack. The Light Brahma cock, as all are aware, should be mated to dark necked hens to throw clean hackled chicks; but the mating of the weak combed Leghorn cock to hens having very strong or even upright combs, seems to be still, to a great many, a closed secret in fowl-breeding.

Such a mating will give cockerels with extra good combs, strong at the base and not liable to twist, but will not, in a majority of cases, yield pullets whose combs will

lop smoothly from the crown of the head, but rather specimens more like the mother, with some lop in the comb, but only after it has risen up firm and unbending from a half an inch to an inch.

To obtain, then, from our flock, fine birds of both sexes, we must make two matings, one for cockerels and the other for pullets. It does not follow, of course, from what we have said, that in *all* instances the natural mating is the wrong one, for in many cases the strain from which we are breeding throws a fair proportion of good cockerels and pullets without special intervention. That this is so in the majority of cases, our experience leads us to think; but, to trust that it is all right, and go ahead haphazard, is a thing no sensible man ought to think of doing.

There is a general law in all matings of thoroughbred fowls which is worthy of the consideration of every one who breeds any variety of birds, and which serves as a reliable guide in all cases when there are insufficient data for deciding from past matings the action to be taken in the future; and this law is simply that of placing each defect in one sex in the breeding pen in apposition to pronounced strength in the same point in the opposite sex. This is not of course, an absolute rule of mating, for it may be modified, or even contradicted, by the known effects of previous matings; but it is subject to fewer exceptions than almost any arbitrary rule which can be applied to any thing so liable to variation as fowl stock.

If one person has been selecting and breeding for a course of years with special care to obtain a particular

shape or marking, that particular shape or marking will very probably be *fixed* in all his stock. If the shape or marking is desirable, because it is intrinsically good, or because it is in accordance with a regularly adopted Standard, all right. It adds to the value of the stock for breeding. There is just so much gained, and the attention may be directed to other matters; perfecting that which has been left out or neglected.

An illustration may not be out of order. Mr. A has a flock of Brown Leghorns, and, seeing that the most remarkable defect in all his stock is a loose condition of the deaf-ear, also a color partly red, looks about for a cock to improve his flock in this respect. He finds one with deaf-ear first rate as regards color and firmness. So far, so good. But this is not enough. To obtain the best results in this direction, he must look a little farther. Is the cock he proposes to purchase only an exception in the yard where he was bred? If so, there is no *certainty* of much advance; whereas, if the cock comes of a stock remarkable for having perfect ear-lobes, *stamped* by patient selection and mating for a long course of years, he will improve the flock of the man who is his purchaser.

Now let us suppose again that Mr. A's stock of Brown Leghorns has been noted for the perfection of combs on his cockerels, the base being strong, the whole comb upright and pleasing on account of its regularity. He has bred not only a few with perfect combs, but the cockerels he produced from year to year have been remarkable in this respect. Admitting that the cock with perfect ear-lobes, which he purchased to improve his stock, is a little weak in his comb, who cannot perceive that, in making

this match, he brings together, not merely two individuals, one with a good comb, the other with good ear-lobes; but one with a comb *hereditarily* good, and the other having ear-lobes *stamped* with the right color and condition by the same influence?

There is much to perplex in this matter of mating. There is also a field for study. Let every one who breeds fowls mend the weak places. What better method than to offset imperfections with strength — and strength that has been fixed like a permanent dye? This may be accomplished, in a measure, sometimes in one's own yards, by careful pedigree, mating one branch of the same family with another. When a breeder goes off for fresh blood, there should be great care taken to get something strong in the point where the home flock is weak.

We may not only mate fowls having outwardly dissimilar markings, but those in which we know there is a constant tendency to certain definite outgrowths in plumage and shape. This is, indeed, but another form of saying that mating by blood or pedigree is the only safe plan, for outward marks on a fowl are but indications of certain combinations of pure blood.

We might continue this subject, which is so full of interest to all who love clean breeding, but must pause here with the hope that we have said enough to impress on all our readers the importance of not only having pure-bred fowls, but also knowing how they were produced, and what established family tendencies stand behind the individual specimen. The traits of the progenitors are like the reserve forces of the military commander. They are what must be depended upon to "back up ' our undertakings.

For a first-class mating, we should select a cockerel with a nice comb, straight, erect, nicely serrated, with five principal points, smooth, and free from wrinkles or indentations, and not running too far forward, or too high in front, as such combs are liable to bulge like a clam-shell. The ear-lobe large, pure white, plump and full, smooth and free from folds. The hackle a deep, rich bay, and well penciled with a narrow black stripe ending in a fine, sharp point, the under-color dark down to the skin. Some birds will have a good hackle, to all appearances, but examine closely, by turning back the feathers, and the under-color will be found nearly white. The other points to be as near as possible as described in the *Standard.* Such a cockerel mated to hens that were fine as pullets, and have held their own against age, with nice salmon breast, nice rich hackle, ear-lobe and comb particularly good — comb, medium, and standing straight in front, other points as near *Standard* as possible, will, if from well-bred stock, give chickens that a man may well feel proud of.

After mating as before recommended, there will, perhaps, remain hens or pullets with very dark breasts, and very dark brown or red on wings. These may be mated with a cockerel having lighter bay in hackle and back lighter in color than required by the *Standard.*

Other pullets having very light-colored hackles with slight black stripe on feathers, and otherwise presenting a faded-out appearance, may be mated with male dark in hackle, both the bay color and the stripe, and having very dark brown or red on back.

These last two matings are only given to utilize

some stock which, though faulty in color, chances to be very acceptable in other respects, such as comb, ear-lobes and symmetry. They may produce some chickens first-class, but not in great proportion.

We are firmly convinced that local causes have a great deal to do with getting good or poor chicks. On this matter the noted Brown Leghorn breeder, A. B. Campbell, Norwich, Conn., writes us:

"I have one line of birds that breed the purest ear-lobes I ever saw, and I let a friend of mine have some eggs last spring, from which he hatched some strong, healthy chicks. They had a good run, but on a wet, black meadow soil, and the ear-lobes were very poor and did not come white, at all; while chicks hatched from the same yard and kept on high, gravelly soil, *but only across the street* from the others, all had splendid white ear-lobes. Good feed, and plenty of green fodder, goes a long way in bringing out fine plumage."

EAR-LOBES.

In scoring, the head figures over one-third of the whole bird; and in selling, a good comb and ear-lobe will sell more birds than all the rest put together; consequently we consider them of paramount importance in breeding, and we think symmetry should follow next.

The tendency to ear-lobes partially red is the thing that tries the patience. Neither a white ear-lobe, or one purely red seems to be a universal characteristic of this breed. The lover of Brown Leghorns is troubled in this respect, and is not in anywise more tempted to be profane, if he is not a saint, than when, selecting chickens,

he finds many all right in every respect except ear-lobes.

Hear him soliloquize: "Now, *that* cockerel would score way up in the nineties, if it wasn't for his ——— ear-lobes."

"There! what a splendid style *that* one has; comb straight as a pickerel, five points — hackle, full, long feathered, golden-bay, a generous black stripe in each hackle-feather — ahem! His neck is superb — breast plump as a biscuit and black as a raven — isn't pursy, either. Wings all right — no white feathers, for a wonder; *lucky* — bows, good red with bay stripes — primaries black, with brown edging — coverts black, with green tinge — sickles same color, with beautiful curve — tail, black, and his legs and feet yellow, ahem! Let's look him over again; — beak, dark stripe on mandible, all right — wattles very good — ear-lobes, *half red* — Jericho! He'd be a perfect cockerel to exhibit or breed, if his ear-lobes were all right. What can I do? It is a long road that is called Selection. I'm almost persuaded to take counsel of Mr. Felch and go away from home, returning with a Black Spanish cock under my arm. A Black Spanish cock would put in the white ear-lobes; but he'd want training — he might put in his legs — actually, "put his foot into it;" but his white face is his strongest point, he'd put in the white *strong;* then we could dismiss him. But then they wouldn't be pure — mongrels — half Black Spanish! Jericho! I don't like that idea — rather have a fresh cock from Leghorn, with good white ear-lobes; ahem! but they say ear-lobes are *mixed* there, as here."

Our breeder of Brown Leghorns talks as above to

himself in his own fowl-house, respecting ear-lobes; and it may be as well to listen while he soliloquizes on

POINTS OF PLUMAGE.

"Now, here is a cockerel with fine comb, lobes, and other things right, but he has a dark hackle. He's the bird to mate with pullets having faded hackles. Everybody *says* so; but I had much rather know that the *mother* and grandmother of the pullets had good hackles. The cockerel with dark hackle will do what he *can* to correct things. But I notice that, although *I* have some whiskers good enough for a man, my little *gal* don't have any — Jericho! Pullets take after their dames in female points. But we will do the best we can; yellow and red will mix somewhat, if we stir 'em together.

"Now, let's sort the pullets; well, their heads are all right in color, if their necks are yellowish-brown. Those with good, distinct black stripes on each hackle-feather I will put together, if their combs are fine, with even points, no sprigs lopping over to one side, according to rule, and not too large; and if their ear-lobes are white; and if their backs are dark-brown, with lighter brown penciled in; and their breasts salmon-brown, shading off light; and their wings with primaries and secondaries black, outer-edge having light-brown penciling; and tails straight up and down, black, long, not too slender, light-brown penciling outside, black inside; and legs yellow, toes yellow, with dark stripe on each — there they are, the young ladies, and all dressed in their best, fit to show or sell to those who will have *none* but the best. Jericho! I'm better on pullets than on cockerels."

Over and over and over again the zealous and enthusiastic poultry-breeder thus scans his flock, and takes solid comfort in noting the peculiarities of each member and selecting with deliberation his breeding-birds.

Sooner or later, all poultrymen in making matings are confronted with the question of

IN-AND-IN BREEDING.

Many and many a time has the too greedy breeder practiced with his fowls the incest which nature abhors, and by breeding pullets to their sire, or, worse yet, sister to brother, preserved and intensified peculiarities of form and color, and thought he was getting on famously. He may have even won premiums with birds poisoned in all their veins by his cursed arts. Meanwhile, nature works her revenge in unimpregnated eggs and weakly chickens, so that the boasted stock leaves few progeny.

It seems to be assumed by breeders, and especially by those who buy eggs at a round price, that in all instances where eggs do not hatch, they are unimpregnated.

But thousands of eggs that fail to hatch contain embryos, in various stages of development, as is proved on careful examination.

This occurs where the eggs given to one hen were not more in number than she could cover, so as to preclude the possibility of their being chilled; and it also happens in cases where some of the eggs in the clutch actually produce vigorous chickens.

People who buy eggs sometimes report that one-half or more of the sitting were *rotten.* Well, those rotten eggs were impregnated. If they had not been so, at the

end of three weeks they would present nearly the appearance of fresh eggs, instead of being in an advanced stage of decomposition. But why, if they are impregnated, do they not hatch? Darwin says, "Close in-breeding continued during several generations between the nearest relatives, if these be kept under the same conditions of life, almost always leads to decreased size, weakness, or sterility."

Now, the eggs that are found rotten come under the head of weakness. The embryo had life, but died in the early stages of development, because the vital force was insufficient. The eggs were the product of a flock, some members being in favorable condition, others not; in the former case, vigorous chicks are produced; in the latter, the principle of life is started, and falls flat in its early stage, owing to weakness.

We are sure that many breeders do not know when nor how much they breed in-and-in. They make up a pen without knowing whether the hens are sisters, aunts, mother or cousins to the cock placed with them. This may sometimes do for once without apparent deterioration. But is it anything strange that such a course, when persisted in for years, should result in weakness and non-hatching?

INTRODUCING FRESH BLOOD.

In the introduction of new elements in our flocks, too great care cannot be exercised to at once secure what will readily affiliate with the blood already in our possession, and, at the same time, be not closely related to it. To be exempt from the deterioration sure to come

of long-continued in-breeding, we must add to the fowls in our runs those which are distinctly different in blood.

To do this most effectively, we must have recourse to birds of the same strain that we are breeding, which, though possessing ancestry identical with that of our fowls, have, by years of different treatment and colonization on different soil, and under differing conditions of climate, become so far alien as to furnish a true cross of blood. That these fowls are more essentially unlike those we breed than might seem likely from a superficial examination, no one who has intelligently followed the constant variation to which all animal life is subject can doubt. We are speaking now, be it noted, not of *Standard* points and markings, but of the more subtle and hidden constitutional peculiarities on which vigor and stamina depend. We are particularly anxious to be understood here, because many breeders are slow in learning that, though they may preserve and even intensify the external *Standard* traits of color and markings by in-an-in breeding, they can only keep and increase constitutional vigor by *out*-breeding.

CROSSING WITH OTHER VARIETIES.

Can we cross with another breed in safety? We have seen that when a stock of Brown Leghorns has been in-bred a considerable time, and thus the vigor of constitution reduced in a dangerous degree, *fresh blood* must be introduced. It has been further asserted that this process of in-breeding fixes a type or certain desirable markings. Now, the question arises, how can you retain what has been gained, and, at the same time, render the

stock vigorous? Some one says, "Dash in some Black Spanish blood and secure the white ear-lobes;" some, Partridge Cochin blood, and sustain the size; some, Black-Red Game blood, to "spindle 'em up stubbed — then commence in-breeding again." Will this wash? Remember the theory is that after you have introduced this new blood you breed the mongrel pullets (and they *are* mongrels) to cockerels or cocks of your former pure stock continuously.

In doing this you reduce the new elements quite rapidly, so that in ten generations the blood brought in by one cross will be as one to 512; in twelve generations, as 1 to 2048. Thus we see that the fresh blood may be "bred out," and leave only a fraction, too infinitesimal to be worth consideration.

But let us attend to what a distinguished naturalist says on this subject: "No doubt it is a very surprising fact that characters should reappear after having been lost for many, probably for hundreds of, generations. But when a breed has been crossed only once by some other breed, the offspring occasionally show for many generations a tendency to revert in character to the foreign breed — some say for a dozen or even a score of generations."

A breeder adopting the theory we have described, will, of course, cut off the heads of all his chicks that "revert" — we mean those with dark legs, feathers on legs, and all those not having a Leghorn shape.

Reader, if you are a breeder of Brown Leghorns, can you not devise a better course than this? We all find it convenient to go "cross-lots" in our walks sometimes. If, to go across, we must wade in snow knee-deep, or

encounter briars and brambles, we may conclude that "the farthest way round is the nearest way home."

PROPER ACCOMMODATIONS.

Having considered the matings which will most effectually serve our ends, we come next to the consideration of the proper quarters for the fowls which we have selected for breeding purposes. The fowl-house should be always dry, light and airy, if we would have any breed of fowls in good condition. But some varieties (notably the Asiatics) will stand more abuse in this matter, without absolutely dying of neglect, than others.

It might seem natural that the Leghorns, from having for generations been bred in the low-lying and swampy lands of Italy, would stand the wet better than the majority of domestic fowls; but when we recollect that, though Italy is wet, it is in a much lower latitude than the one we live in, and that it possesses a very mild climate, we see that the cold of our winters is the foe to be guarded against most carefully.

The house we build should, then, be constructed with special reference to winter protection. It should face the south, and have a dead wall, thoroughly tight, on the north and west sides, and should be glazed on the south. The roof may, in many instances, consist entirely of a glass front, fitted green-house style, sloping from the highest point of the rear wall to a point only a little above the ground on the front.

Changes to suit the varied circumstances, and with regard to our available space, can, of course, be made; but the points of protection from cold winds, and the

proper glazing to secure light and heat, should never be omitted. Any ground that is left unvisited by the sunlight, becomes damp and unhealthy; dampness leads to roup, and roup to death, and both combined to a serious inroad on the profits of the business.

This style and manner of building is recommended to those having a location adapted to it. All people who might desire to build in this way do not own land sloping to the south so that this method could be adopted. A gentle slope will answer the purpose. Of course there must be an excavation, and the earth that is removed may be thrown to the northward, forming an embankment, and raising the ground on that side, thus giving place for a wall seven or eight feet high. If the earth is composed of sand or gravel, all the better. Such a wall built in a clay bank is very liable to be crowded from its place by the action of frost, and to prevent this it is expedient to back up with gravel or loose cobble-stones, and lay a tile drain at the bottom to take off the superfluous water at the time of fall rains. With these precautions the wall will stand. A bank-wall will not resist so much lateral pressure as one sustaining the weight of a building; hence, a wall of this kind should be laid with an eye to strength and durability.

How shall the breeder of Brown Leghorns, living on a very level location, make a suitable house for them? This question may be answered very briefly. We should say, whether you make the building of wood or not, make it *tight.* It should not be ventilated by a thousand holes and cracks. Some very warm houses have been built of cheap, rough lumber on the outside, lined with

a four-inch wall of soft brick, or broken brick, and those otherwise unmerchantable. The brick may be laid in cheap mortar; and if the north side and west end of the building is lined in this way, Boreas cannot get in The east end should also be made tight; and if a window is desired there, it should be fitted with as much care as any man would demand for his own sitting-room. The same care should be exercised in fitting all the sash on the south side. The carpenter who says, "No matter, it is only a hen-house," or, "Good enough for this old barn," is not the man to have around. No one can afford to have all the expense of putting up a building, and, after all, some cold morning find his Leghorns with combs frozen because the material of the building was not fitly joined together.

The rafters and the plates should be so framed that no crack may be left between the roof and the sides. The under-sides of the rafters should be tightly boarded, and the spaces filled with fine hay, straw or sawdust. If more convenient, or to the owner's taste, the building may be lathed and plastered on the sides and overhead.

Such a building may be covered with fine lumber and painted nicely, if desirable; we have only been writing of what is indispensably neccessary in the construction of a house for Leghorns in a cold climate, knowing that this breed, without this careful provision, will not thrive nor furnish many eggs, either in winter or early spring.

INTERIOR ARRANGEMENTS.

The remaining points of interest within the house are the perches and the nest-boxes. Of the former we need

say little. They should be about two inches wide, and have smooth, round edges that will not cut or in any way maim the feet of the fowls, and should be placed about three feet above the ground. Be sure and have the perches all on a level, or the fowls will fight for the possession of the highest and knock each other off and make trouble generally every night on going to roost. Beneath them should be a board to catch the droppings, which should be removed daily, and the board covered with pulverized dry earth or coal-ashes.

The nest is the subject of much thought and discussion among breeders, and as the scene of the Leghorn's greatest triumphs deserves our most careful attention. In buildings such as we have described there is no dark spot where the hens will find themselves sufficiently secluded to suit their taste; and, to offer them the conditions they will most readily accept, we must make an arrangement in the house to hold the nest-boxes. This arrangement may be simply a long box, a foot and a half high and two feet broad, with an alley-way on one side and boxes filling the remaining space. To obtain access to the nests for the purpose of removing the eggs, the top of the box may be made with hinges, *and a lock*, or there can be hand-holes cut out at the back of each nest.

The runs for such a house may be as large as the owner chooses to have them, and may be made of plain laths, with a frame of two-inch stuff, or preferably of the tarred-twine netting, which has lately become so popular. Space on the ground is what is required, and above two feet and a half in height — provided they are covered

—we need not go, for that height will accommodate the highest-combed crower of the flock. The low, covered runs have their advantages of cheapness, this form requiring less netting, if the run is small, than would be needed if the sides were carried up six or eight feet, instead of covering the top. But the disadvantage of a covered run is that it cannot be entered by the owner for the purpose of shoveling away snow, and the builder must, of course, study his particular needs, as affected by situation and climate.

REPRODUCTION.

With a well-appointed fowl-house, and a contented flock of fowls within it, the work of reproduction, as far as it depends on the females of this breed, is very rapid. Eggs accumulate, and, as the proper season for hatching approaches, our incomparable layers turn them out with most gratifying rapidity. It behooves us to make the usual arrangements for replacing the stock sold the past season.

The nests of the sitters—Brahmas, Cochins, Plymouth Rocks, or whatever breed we may appoint for this task—should be constructed in a secluded place, where no vagrants of the tribe can torment them. Having decided on their location, we can begin operations with getting a sod, on which to build, that will fit into the box we have set in place. The next thing is to hollow out the sod (which has been put in place roots up) to the form suited to hold the eggs neatly. When this is accomplished to our satisfaction, we can lay in the nest material proper, and adjust the eggs in place. If very early in

the season, line with soft, bruised straw, and finish off with feathers; later, omit the feathers. Let each hen have a pen to run in, to which no other fowl can gain admittance.

It now only remains to place the hen, which we have previously assured ourselves is thoroughly broody, upon the nest, and await patiently the twenty-first day and the arrival of the chicks. Meanwhile, we keep a sharp look out for all sorts of parasitic adherents, and occasionally dust carbolic powder into the nest, as a gentle welcome for any that may happen in on a prospecting tour.

During all the period of incubation we take special pains to interfere as little as possible with the operations of the hen in possession, and not to scare her into breaking any of the eggs. If such an accident does occur, we must wash all the eggs separately with tepid water, and replace them in the nest with as little jar as possible. With such precautions, and the use of an egg-tester, we can count pretty nearly the progeny to be expected, and be ready when they arrive to go understandingly into the work which will be our next subject of discussion, the

CARE OF THE CHICKS.

The breeder's part in the care of the chicks can hardly be said to begin until they are a day old; for up to that time they require no food of any sort, and are all the better for being let alone. At the expiration of this time, however, we can commence to assist nature by feeding the chicks, five or six times a day, a little hard-boiled egg, chopped fine, and crumbs of bread wet

with new milk. We can continue this diet for two or three days, and then begin to give corn-meal, scalded and mixed quite dry; so dry that it will crumble like "Johnny cake."

We must be especially careful that no wet or sour messes go to the chicken-coop, or we shall have a large number of beautiful little brown chicks that will never grow up. Leghorn chicks are, however, among the most hardy, as well as the most precocious, of all fowls; and if we give them a fair chance, will thrive and shoot up to independent chickenhood before we are fairly aware of it.

No domestic fowl is so rapid in acquiring its permanent feathering as the Brown Leghorn. At the age of four weeks it is perfectly easy to tell the sex of any individual of a flock by the most unmistakable signs. At five weeks the cockerels have fair promise of the beautiful tails they subsequently carry so gracefully, and at six weeks some of them have the impudence to fight vigorously with other sparks of the same brood.

At two months it is evident that the time has come for separating the sexes, or, at least, keeping the cockerels with only pullets of their own age. By this time the season is so mild that a good run, with a shed sufficiently large to afford shelter from storms, is all that is needed for their accommodation, and here we may leave them to grow and become daily more beautiful until we want them to send out as competitors at the shows, or to fill orders. During the whole summer and late into the autumn a building with a roof, but no sides, is the best shelter for them to roost under. Pure air is thereby

secured. Many of them have, of course, left the coop, for reasons over which they have no control, and avhe figured as broilers and spring chickens to very good purpose; but a large percentage has been adjudged worthy of life, and await the future with a calmness undisturbed even by the lively daily competition for grubs and worms, and the tid-bits from the table.

While one sex has been thus employed, the other is not one whit behind in precocity. At the mature age of four months quite a number of the pullets will lay at intervals, and at five months a good share of them are going full blast and earning their epithet of "egg-laying machines." As the year rolls on, they keep on with their extraordinary feats, and before their birth-day comes round have done enough business (if properly cared for and housed) to entitle them to the epithet of "every-day layers," which is often claimed for them.

Tables which have been carefully prepared show these fowls to be what their owners claim — the greatest egg-producers, from a given amount of food, of any fowls ever cultivated by American fanciers. We need only cite the detailed statements which have appeared in *The Poultry World* and *American Poultry Yard* in proof of these records; for, though it is possible that one man might be led by his enthusiasm to over-state results, the similarity of different accounts lends the strongest presumptive evidence of their truth.

PREPARING FOR THE SHOWS.

The tales of Leghorn precocity and fecundity are endless, and all go to prove their high rank as profitable

and useful tenants of the poultry yard, no matter where located: but besides this, they are among the most beautiful of all the yearly contestants in the show-room; and being such, we must consider them as ornamental pets, as well as profitable stock.

At any time from the day they chip the shell till they come in perfect order to compete for premiums they are a pleasing sight, with their rich orange hackles, brilliant black breasts and magnificently barred wings; but spite of all these points, which, were they simply compared with other breeds, would entitle them to high honors, they need special preparations for exhibition. The most important of these is washing, to remove all dirt marks and accidental impurities which have fastened on their plumage.

To do this properly we must have a warm room (a back kitchen will do), tepid water, castile soap, a large tub and a good-sized, soft sponge. Armed with these implements, our first step is to fill the tub to the depth of about seven or eight inches, and add to the water a spoonful of ammonia. Next, we set the fowl in the tub, and placing the left hand upon its back, press it down until its back is level with the water, and, rubbing the sponge on the soap till we have a stiff lather, sponge the fowl all over gently, till the suds have permeated all parts and dislodged the dirt effectually. In doing this we take the greatest pains to avoid breaking or marring any of the feathers, rubbing always *down* the quill, instead of up.

After the cleansing process is complete we remove the fowl to a new and clean coop, well littered with fresh

straw, and let it remain over night in a warm room — preferably the one where the washing took place — to dry and plume itself. The next morning — which is presumably the one on which the birds are to go to the place of exhibition — the legs should be carefully rubbed down with a soft woolen rag, wet with turpentine and a few drops of sweet oil; this will leave them of a rich yellow color. The wattles, comb and earlobes should also be carefully freed from all impurities by the same process, and the fowl is then ready to start. Nature has done much for it, and man has supplemented nature to the best of his ability, and can now ship his birds in coops carefully inclosed in coarse sacking, if the weather is cold. Before submitting them to the judges' criticism and to the inspection of visitors, olive oil should be applied to the surface of their plumage, to produce the necessary gloss, and the owner can then be satisfied that, if they do not win, it is not on account of his negligence. This matter of showing Brown Leghorns lies pretty nearly in a nut-shell; the unprepared fowls stand no chance in close competition, other things being equal.

JUDGING BROWN LEGHORNS.

Under this head we shall describe some of the most easily understood fine points for show purposes, which the general wording of the *Standard of Excellence* does not explain in a way to give the reader who has no previous knowledge of the breed the idea of just what to look for. We can hardly call this conciseness of the *Standard* a fault; for if it dealt in full explanations, it would be too voluminous and costly for general use. Its brevity of

description is best, under the circumstances. That it leaves this task of special elucidation to treatises on single varieties is right.

Beginning, then, with the comb of the cock, we note that it is subject to two express disqualifications, being twisted, or lopped over to one side. To detect these defects, look at the comb when the cock is standing erect and directly facing you; a twist or lop will show distinctly.

So much for the abstract disqualifications; and next come points about the head worth notice, as they affect the score. The comb should be smooth, and not coarse and pimply, the smoother it is, the better. The wattles are principally judged by their smoothness and the absence of irregularity of outline, and it is worth remembering that both comb and wattles grow rough with age, to a greater or less degree, so that those of a cock are rarely as fine as those of a cockerel.

Red ear-lobes are a disqualification. This is an easy matter to decide upon, apparently, for a glance shows a red ear-lobe; but there is an ear-lobe often seen that is "between hay and grass," and shows a little red rim on the lower edge, a matter for hard cutting, but not enough to lose a premium, if the fowl is all right otherwise.

But when there appears only a slight tint, or speck, of pink or scarlet upon a "white" ear-lobe (as sometimes occurs in the choicest samples), this defect must be dealt with according to the extent in which it appears.

In the case of the Brown Leghorns, those wearing the clear white, unstained ear-lobe and well-formed wattles are

credited in scaling with fifteen points for these features. For the slight discoloration to which we have now alluded, a cutting down of two or three points in the ear-lobe score would, in our judgment, be ample.

If the ear-lobe is one-half red, and the whole ear-lobe is supposed to be credited with ten when perfectly white, we should cut five. If one-fifth white, we should cut one-fifth, or two, and in like proportion in all cases.

The disqualifications of white or partially white feathers in the hens are to be liberally interpreted. If these might easily have been removed without detection, the bird cannot, by the rules of common sense, be disqualified. The objector may urge, "The *Standard* don't say so." We reply that the law of common sense is a "higher law" than the *Standard*, and without it neither the *Standard* nor any other book, not even the Bible itself, would do men any good.

We have said, in speaking of the ear-lobes, that the deduction for the imperfection of red should be in proportion to the size of the red portion. Now, in reference to the details of the plumage in either sex, the ideal perfect wing or back or breast is supposed to be credited with the full number of counts. The imaginable bad — very bad — wing or back or breast is to receive no counts at all. That is, the worst wing or back ever seen or imagined at a show, or elsewhere, on a pure Brown Leghorn, is in theory to get nothing. The perfect wing or pair of wings is to receive the full number of counts (5), and wings of various grades of merit or demerit between these two extremes are to receive *their share of five*, according to their quality.

This is the universal principle to be kept in mind in judging symmetry, condition and all other sections, weight in some cases excepted. The theoretical perfect feature is to get the full tally of points. The feature so bad as to occupy the position of the *other extreme* is to get nothing, and intermediate stages of defect or excellence get their strict mathematical proportion. Too often the incompetent judge hasn't the slightest idea of this broad principle, which appeals alike to all sections of the *Standard* on all breeds, *provided* the matter under consideration isn't in the table of *disqualifications.* For a disqualification is, as the term implies, *a disqualification*, and "that's the end on't." The unfortunate specimen afflicted with one can get no score at all, but is ruled out of the competition.

There need be nothing further said here about the details of the plumage, except that in the female a close examination of the neck should be made, to see that each feather next the quill is of a clean black, unblotched by encroachments of the orange-color of the outer part. This is a nice point in this breed.

The last matter we shall consider is the tail and its carriage. A squirrel-tail, as its name implies, is one carried up toward the head, forward of a perpendicular line, in a way to give the fowl a shut-up appearance, as if it had been jammed together somehow. A wry-tail is one carried habitually on one side of the line of the body. A fowl may carry its tail thus for a time for no good reason; but if it is a permanent habit, it is a disqualification, and comes from a malformation of the rump. To decide whether the fowls are wry-tailed, toss

them once or twice; and if they persist in holding the tail to one sides, the evil is unmistakable. Wry-tails may come from a chance injury; and some fowls, when the sickles are growing, after the moult, carry their tails awry for weeks from local irritation, and this must be considered when we examine our fowls. Of course no specimen would be sent to a show in the pin-feather stage. So no allowance need be made for this state of affairs in looking at the fowls on exhibition.

There are many other things which may be discussed in this connection, but all of them are of such a nature that without a live specimen to serve as a text for our explanations, we could speak of them only in a general way, and that would serve rather to mystify than to enlighten the novice. The best way to get a clear understanding of these matters, after posting ourselves as thoroughly as possible from the *Standard of Excellence* and the best poultry literature attainable on the subject, is to go to a good exhibition and apply to all the birds of this class on show the rules we have learned. Of course you cannot from a single exhibition or a single fancier gain a *perfect* knowledge of all the nicities of form and coloring of plumage; but you can get a solid basis of information on all the most important points that will prepare you for further acquisitions. It is the finish that tells in all the work; for the cock that scores ninety-five points is more than twice as valuable as the one that is credited with eighty-five, and the knowledge which enables us to distinguish unerringly the exact merit of the two birds is equally serviceable. Knowledge is power in this, as well as in other business, and in very

exact ratio to the knowledge of the breeder will be the prizes he takes, the fame and satisfaction he wins and the money he receives from the sale of his fowl-stock.

ROSE-COMBS.

The discussion of the purity of the newly-brought-forward Rose-comb Brown Leghorns has turned a great deal of attention to the subject, and led us to investigate their claims carefully. This branch of the Leghorn variety bids fair to become fully as popular with many of the best breeders, particularly those living where the cold of winter is intense, as the single-combed variety. The Rose-comb is practically invulnerable to the attacks of Jack Frost, and needs none of the precautions that we must take to insure the preservation of these parts in single-combed fowls. Mr. F. H. Ayres, who has had opportunities of becoming thoroughly conversant with the history of these fowls, and is, beside, a breeder of both Rose-comb White and Brown Leghorns, in response to a request for particulars concerning them, writes as follows:

"I cannot claim the honor of being the first to breed Rose-comb Brown Leghorns, as my ownership of fowls that I consider Simon pure is of comparatively recent date; but I have taken pains to learn all that I could of their history, and give it for what it is worth. The second importation of Brown Leghorns to this country, made in 1852, by Capt. Gates, of this place [Mystic River, Conn.] contained fowls that were divided among the captain's friends and neighbors, and bred more or less carefully for a number of years. Of all those who kept them for a time, but one man has kept the breed

intact from its first consignment to his care. This man's flock, then, furnishes the only reliable data on which to base my inquiries; and so considering the case, I began, like the typical Yankee, to ask questions; and this is what I evolved: In the first place the imported flock contained not only single-combed, but rose-combed fowls, and these last were not one whit inferior in purity and markings of plumage to the single-combed variety, as was seen by the perfect identity of carriage and fine points of plumage, as well as the exact equality in prolificness and the non-sitting instinct.

"Had the matter been left to take its natural course, I have no doubt that the rose-comb, from its very evident superior adaptation to our climate, would have driven the single-comb out of existence, and pure single-combed Brown Leghorns have been as rare as pure rose-combed fowls of the breed now are. By the time I had learned all these facts, I became assured that the Brown Leghorn was the fowl of the future, and began looking about for birds enough to start a yard with, and procured some pure-bred rose-comb stock of the Mystic blood, which were satisfactory.

"This tendency to red ear-lobes, by the way, is derived from fowls of the early importations; and though it has been bred out very carefully, is no proof that the fowls that show it are from impure blood. The 1852 and 1853 birds as well, were full half of them characterized by clear, smooth, red ear-lobes; but this marking has gone the way of the original rose-comb, and I would not recall it, were it in my power to change the *Standard.*

"Returning for a moment to the qualities of the Rose-combed Leghorns, as compared with the single-combed fowls, it seems to me to be worth while to correct the groundless idea that all birds having large single combs are far superior to any not possessing this form, as egg-producers. This idea arose very simply from the fact that the Leghorns, White and Dominique, as well as the first favorites, the Brown variety, were so incomparably superior to any other breed as layers (some strains of Hamburgs possibly excepted) that the *tout ensemble* was accepted as the type of the best possible fowl for this purpose; and those who had stowed away this idea as fact could not bring their minds to see that the change from a single-comb to a rose could not affect the welfare of the birds, except as it made them more comfortable, and consequently (if possible) more productive.

"Let any one who doubts the force of this reasoning look at the Asiatics and compare the Pea-combed Partridge Cochin with the old-style high, single-combed fowl, or the Light Brahma, with its close triple-comb, to the fowls of twenty years ago, and ask himself if the change of comb has helped or injured their laying qualities.

"For any one who looks at the matter candidly, there is, it seems to me, only one conclusion to be reached—that the day of single-combed fowls, as prime favorites, in our northern latitudes, where the great numbers of pure-bred fowls are raised, is a thing of the past. Ten years hence, rose and pea-combed birds will, I feel convinced, be *the* fowls; for to beauty, equal to that of their single-combed brethren, they add solid advantages that the latter can never attain."

Porter

THE PLYMOUTH ROCKS.

HOW TO

MATE, REAR AND JUDGE THEM.

By H. H. STODDARD,

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HARTFORD, CONN.
1880.

PREFACE.

No breed of fowls have attracted more attention or gained more popularity on account of their sterling qualities than the Plymouth Rocks have during the past few years. The peculiar make-up of these fowls has given to them a certain hardiness which fits them for the farm and recommends them to the ordinary poultry keeper.

Thousands are now striving to improve this comparatively new breed. The faults as well as the fine points should be well understood. Fanciers have been engaged disseminating Plymouth Rocks, supplying the demand. The call now is for *Standard birds*, not for those with dark beaks and legs and indistinctly-marked plumage.

During the next ten years there ought to be a weeding out of the minor faults which are apparent even in the best strains. Very superior specimens will be in demand, and he who can produce Plymouth Rocks with the best symmetry and color of plumage, legs, beaks and ear-lobes, and well-shaped combs, will reap his reward. This book is intended to help on the good cause.

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THE PLYMOUTH ROCKS.

WHAT the Plymouth Rock of to-day should be, almost every fancier thinks he knows. That the type held in the mind's eye of each separate fancier is not a universally accepted one is of little moment, it is sufficiently near the same thing in all cases to show that the breed is no longer a thing to be, but an accomplished entity.

Years of breeding will, of course, draw the threads which weave the traits of forgotten ancestral stock to a more perfect web, and we shall have a fowl as perfect in its reproduction as any of the longest-cultivated varieties of to-day; but probably no period of equal length will show such improvement as the five years preceeding 1880. Truly there must have been good material at hand to make a cross that in such a short time could be brought to such a nobly prominent position as the Plymouth Rock holds to-day. Let us see what were the influences of blood and breeding that were at work.

DOMINIQUE AND JAVA.

It is now universally admitted that the Plymouth Rock is the resultant of the process of breeding the old-fashioned Dominique — the native American fowl — on Black Java hens, a sort now nearly or quite unknown in this country; but who originated this cross is a matter of dispute which wlll probably always remain in *statu quo.* It is enough for the breeder to know that the union of the hawk-color and the black was effected, and few will care for purposeless search beyond Drake or Ramsdell or Upham. We are all looking forward and not backward, and were the entire past of this breed—save the knowledge of what the cross was—blotted out, breeders would be no way troubled to manage their stock as successfully as ever. Still, the history of the breed contains much of interest, and we will give briefly the history of Plymouth Rocks—ancient and modern—before going into the discussion of questions more immediately affecting their treatment in the present.

OLD LINE ROCKS.

Of the varied elements which went to the making of the Plymouth Rocks of 1849 there is little doubt, for we have the record of their original breeder, Dr. J. C. Bennett, as an authority. From this it appears that the male progenitor was a Cochin China cock, and the hen a cross of three distinct breeds—Great Malay, Fawn-colored Dorking and the Wild India fowl. All of the three latter were well known and commonly bred at the time

when this cross was made, but have since been supplanted by improved varieties.

The Great Malay was of Asiatic blood and was always exhibited in that class at the poultry shows, but, except as a new wonder in the class which then was such a source of astonishment to all beholders, had little merit.

The Fawn-colored Dorking was, as its name implies, a Dorking, neither more nor less, and very much such a bird as is now bred under the name of Colored Dorking, presumably. Of the Wild India fowl we know little. Its influence on the original Plymouth Rock was, of course, small and had no great or perceptible influence on the bird.

In shape, the Old Line Rocks were rather triangular—a probable souvenir of the Cochin blood—with a slight leaning toward the squareness of the Dorking, from whom they inherited also a frequent fifth toe. From the Cochin they took leg-feathering, and from the mixed blood of the several parent stocks, plumage of diverse colors laid on in a helter skelter manner that was unique but hardly æsthetically correct.

Spite of all these defects of one sort and another the breed was well liked and had many adherents. It is very likely that while the admixture of so many uncultivated and strong bloods brought out a mixed and unsightly coat, they induced also an extraordinary amount of hardiness and fertility, but the record of the breed is so scanty that we have scarcely enough data to assure us that such was the case.

However that may be; whatever their excellences, the

incipient breed ran out completely, or ran in to anything and everything by admixture with diverse breeds, and for years no Plymouth Rocks existed. Then came another fowl of entirely new blood and finding the name ready-made but the fowls it used to represent extinct, accepted it as the title best suited to its solid merits. At this point the Old Line Rocks disappear: henceforth the title Plymouth Rock means the fowl of to-day.

ADVANTAGES OF PEDIGREE.

We need hardly, at this late day, when so many thousand choice fowls have been registered in the *American Poultry Pedigree Book*, point out the desirability of keeping an exact record of the lineage of our stock. In all varieties of cleanly-bred fowls some such register is of the utmost value. Not only does it give us easily accessible data concerning our own stock, but it enables us to buy a more perfectly-defined bird than we could, in all probability, otherwise obtain. When selling stock we can always command better prices for a bird whose genealogy we are not afraid to publish openly to the world than for another equally good, to all appearance, which is a solitary specimen and of unknown extraction.

There is good reason for this in the fact that a bird by all the ordinary tests may rank high and yet be simply a mongrel, the "come-by-chance" offspring of different breeds or even of mongrel stock.

This last is particularly liable to be the case with the Plymouth Rock, which, in plumage is somewhat like the hawk colored dunghill bird once so common and even

now often seen in a yard where common stock is accustomed to run with a lusty Plymouth Rock male. All who have bred the variety which is the subject of this monograph know from practical experience, that in breeding from even the best strains we obtain many imperfect chickens, which, if allowed to grow to maturity become imperfect fowls. In point of fact such birds are often reared and kept for sitters. Now, if these imperfect birds are bred to standard specimens, although the general result is poor, a few choice cockerels or pullets may be obtained.

We have then stock that will sell readily on its appearance, yet is subject to a constant uncertainty on the score of reproduction. It is precisely here that the *Pedigree Book* tells the story, for as we trace the line backward we come to a gap where the blood of the imperfect and unregistered sire or dam was introduced.

Let no one for a moment suppose that we advocate the theory than an un-pedigreed fowl *may* not be as true and pure as any other. Of course, good birds may be reared in quantity and never registered, and plainly their registration can make no point a whit better, but how can we show to those who are looking for choice birds, that we have what they are seeking. It is well enough to write to the enquirer that the fowls are from superior stock, and that the line can be traced back through many a fine sire and dam, but it hardly answers the purpose of one who wishes to get fresh blood as nearly identical in general character with his own, as possible.

Pedigree registration is a sort of commercial agency,

which saves tedious processes of inquiry for each patron, and enables him, by the payment of a small sum, to get information that were he alone to endeavor to collect it would cost thousands of dollars.

BREEDING LARGE NUMBERS.

Beginning with strictly pure and finely marked breeding stock we may yet in the course of a very few seasons go from bad to worse so rapidly as to have, ere our flock is in its fourth year, little better than dunghill stock. To avoid this fate we must have recourse to the plan indicated by our title in this chapter and breed large numbers of chicks yearly. There is a constant shrinkage in our number of young birds from the time they chip the shell till they are fully grown, no matter how carefully we may meet their needs as far as we know them.

In estimating, then, the number of eggs that must be set and the chicks we expect to hatch out we must allow a liberal possible percentage of loss, so that after deducting for every cause we may still rear a large number of fowls to the age where we can readily tell which are worth preserving. At this point comes in another, and with this breed quite appreciable, item of subtraction. It is but fair to say that if we start with twenty chicks not more than fifteen will live to the age of broilers, and of these not more than ten or eleven be worth saving until riper age shows their value more clearly. Of this number, not more than three or four will be first class, and the other six or seven "fair to middling." This supposition is, of course, not in accordance with

the experience of all breeders, but it may represent a fair average sample merit and is sufficiently accurate to answer the purpose of the illustration.

It is self evident that the breeder who has but three or four good birds to show for his season's breeding is in no position to sell any stock, for a single trio would exhaust his resources and leave him plus some cash, two cockerels and his old stock. Neither has he enough fowls to continue the business on an increased scale the next season. To all intents and purposes he has lost a year.

To prevent such a misfortune there is but one resource; we must breed large numbers. If, instead of twenty the breeder starts two hundred chicks and with good management rears thirty or forty number one cockerels and pullets, he has reason to be very well satisfied with his work. With such a number he can sell stock enough to repay the season's outlay, give him a profit, and leave plenty of lusty young stock for the coming breeding season.

The reasons we have already given for rearing large numbers hardly need anything to supplement their force, yet the point which most nearly affects the fancier is to come. Every breeder is called upon during the show season to furnish exhibition fowls properly matched for show purposes, and if he has plenty of stock to select from, can fill such orders at a good profit in both reputation and coin. To make the best choice of a prize trio, the breeder must have the requisite amount of material. Could a skilled Plymouth Rock breeder have a

lot of one thousand fowls from which to pick prize winners, there can be no doubt that he would get far better results than if he had ten separate flocks of one hundred each with no power to match birds from one flock with those from another. As the number from which choice is to be made decreases the excellence of the matchings must be rapidly lost until we reach the point where but one trio is available and no choice remains.

To sum up this whole question briefly, we may say that breeding large numbers is the greatest secret in poultry breeding yet discovered. It may not be easy to breed large numbers the first year, but after the attendant machinery is well set in motion we can easily keep it going smoothly. We can hardly give a better or more pithy dictum for the consideration of ponltrymen generally than that contained in the three words, "breed large numbers." But do not crowd many in one flock or one place.

THE BREEDING COCK.

In breeding poultry of any variety it is of absolute importance that the male bird be virile to the highest possible point. His power of procreation should be one of his chief merits. No matter how cleanly marked his plumage may be if he is sluggish in his motions and pays little attention to his flock, he isn't worth a picayune for breeding purposes. "Off with his head."

Hens will lay as well or even better when not associated with a cock, and if we cannot have a crower that will thoroughly fertilize the eggs, we might better save

the time of the sitting hens and our own annoyance, by using the eggs for culinary purposes.

In this connection we may very properly note the fact, that a male bird kept stived up in confined quarters will lose his virility to an extent that few breeders who have not watched the effect of such treatment will credit. Even if he comes of a long line of fowls noted for their prepotency, his prestige as a stock-getter cannot overcome the withering influence of close confinement.

When, as is sometimes the case, a run large enough to give all the fowls the privilege of *ample* range cannot be had, it will be found a good plan to keep the cock apart from the hens until the breeding season arrives and then divide the hens into two small flocks with which the male is placed on alternate days. Under such a system better results have been obtained, in a majority of cases, than by the common method.

The male has a share in determining the size, shape and plumage of many more chicks than has any one of the hens, and hence is more necessarily the very best bird attainable than any one of the hens he consorts with. His influence extends to *all* the chicks while that of each hen affects only a small percentage.

The perfect cock of a Plymouth Rock breeding pen should be full standard weight, but little over it. He should be "built from the ground up" with unmistakable solidity but no clumsiness. The toes strong and clean cut, not running to the nail as thick as at their junction but tapering, above the foot a clean solid leg of a rich

golden color undimmed by parasitic blotches, and resting on this the solid clear-barred body.

We need hardly describe the carriage of an active crower of this breed for the image that rises in the mind of every fancier is nearly the same. Solidity is its most apparent characteristic; while the sober gray of the plumage is offset and enlivened by the clear red of comb and wattles and the brightness of the eye.

The Plymouth Rock is a *satisfying* bird in almost every sense. Look at a flock of these birds at a distance and you can scarce distinguish the males, at first sight, but examine closer and the eye soon learns that the first-class Plymouth Rock male is as truly in all points the head of the house as in the case of his more gaudily plumed brethren, the Games or Hamburgs. Give us good males and the task of producing noble specimens is a comparatively easy one.

Farther on we shall speak of the comparative merits of light and dark cocks, and just here merely remark that whether light or dark see to it that the markings are clearly defined. The bars should be clean cut and distinct in every part of the plumage up to the eyes and down to the bottom of the thighs.

Aside from plumage, the symmetry, breast and body are very properly made prominent in the *Standard of Excellence.* A full round breast is of the utmost importance and no solicitude in regard to color of plumage, ear lobes and leg, or shape of comb should lead us to overlook the advantages of that robustness and rotundity that give the progeny vigor, size, and a fine carriage.

Symmetry is the proportion which the parts bear to each other. A coat may be well enough on one man but out of all proportion on another, and so a comb or neck or tail that is well enough in itself and enhanccs symmetry on one bird, would have a contrary effect on another, because not harmonising properly with the other members.

Every year people are learning the distinctive shape of Plymouth Rocks The chromos and engravings made to represent specimens help to fix true ideas of their shape or proper symmetry. It is not easy to write a description of the symmetry of this breed. One can better learn this at exhibitions, where the best specimens may be seen. It would be very bad policy to breed from a cock having a very long neck and short legs, or having legs very long and standing near together. The comb is very liable to be crooked, carried too far back, pimply, or irregular in its serrations. A small comb, thick at the base, is apt to be free from faults, while a large comb is generally uneven, lopped, or has kinks and sprigs. These sprigs are only the reversion toward the rose-comb of the Dominique ancestry. The comb is the hardest thing to get right on any breed of fowls. Large wattles generally indicate potent breeding properties, unless the bird is coarse, leggy and overgrown.

THE BREEDING HEN.

Ever since Eve was created, the female has been of the lesser public importance in uncivilized life. (That women rule the men of this century has nothing to do

with the matter.) Feathered stock furnishes no exception to this rule, yet good hens are as absolutely necessary to careful breeding for nice points as good males.

As with the other sex the great desiderata are Standard weight, harmonious outline and clean markings. Due regard to these fundamental requirements will cause many promising chickens to see the light and give us, if we have obtained a male such as we have described, a number of first-class birds. Still, in selecting hens for breeding there is one thing more to be done if we would have the most satisfactory flock; and that is getting hens and pullets that are matched in degree of color as well as in other points.

Nothing will sooner disgust visiting fanciers than a lot of fowls, all Plymouth Rocks, to be sure, but scarce any two fairly even in point of color; while no one excellence will insure more sales than uniformity. Like produces like in this matter very nearly, and we can by a little thoughtful work at mating time help materially the progress toward uniform coloring, we are all aiming to push to the point where progression stops and perfection is attained.

MATING.

Shall one mating be made for the purpose of producing well-colored males, and another to produce females, or shall the fancier mate one way for the production of both sexes? Shall the practice be followed of mating light birds of one sex with dark ones of another, or is it better to select nothing for breeding stock excepting

medium-colored birds of both sexes, of the same shade of color like those preferably exhibited together? These questions are continually agitated among Plymouth Rock men.

The reply is, that while very light and very dark birds should never be used as breeders at all, yet in the present state of the breed, moderately light may be mated with moderately dark ones, or medium (neither light nor dark), may be mated to medium. Also, different combinations may advantageously be made according as our object may be to get pullets or cockerels. That the breed will ever arrive at that stage where the males will be naturally produced as dark as the females we very much doubt, and till that time arrives we must make the best of things as we find them, and at the same time, try to bring about that state of things as well as we know how.

At present, and ever since the breed was known the males have "run light" and the hens dark. That is, in every yard of Plymouth Rocks the fowls are found varying in color, both cocks and hens. Among the former a very few are what would be called dark, a considerable number medium, and a large number light, or very light, so that they may be called light as a rule. The hens are in greatly preponderating numbers, very dark, a few lighter and a *very* few what may be called light, or about the same shade as a dark medium cockerel.

These light pullets and dark medium cockerels match in the pen, and from them are selected the exhibition birds. They are desirable, but few; being few they are

in great demand. Breeders wish to mate their stock in such manner as to produce the greatest number of these light-colored pullets. Every year in which the lightest colored pullets are used successively tends to *fix* a lighter shade on the female side. The light-colored cockerel and the black hen draw in opposite directions. Can the Plymouth Rocks be so changed by breeding as to approximate, and finally draw together? Perhaps so and perhaps not. It can only be accomplished, if at all, by patience and effort in the right direction. It never will be done by persistently using a light cock.

The change must be gradual. It will be advisable for the breeder to make three matings. In the first place, all the lightest cockerels and all the darkest pullets should be rejccted as unfit to breed. Then much attention should be given to the color of the legs. It is very important that a breeding cockerel should have not only legs yellow, but *very* yellow legs. The pullets at first can not be found in considerable numbers with pure yellow legs, but after culling out all that show glaring imperfections, and those very light or very dark, take of the remainder those pullets that are the darkest and mate them with one of the lightest cockerels not near akin. This mating will not produce exhibition cockerels, and the majority of the pullets will be about the color of the dam—the lightest will be useful.

Then take those pullets a few shades lighter than those of the first mating and mate them with a medium colored cockerel. This mating will produce a good per cent. of standard chicks, more especially cockerels.

Lastly, place the lightest-colored pullets with a dark medium cockerel. In this mating the sexes are nearly of one color. Every breeder should make such a mating as this every year. We have conversed with many breeders who have made this practice without getting black chicks, but just so sure as the thing is overdone and you use *too* dark a cock in the breeding pen you will have a lot of pullets as black as crows, with green-black legs. The whole season's produce may be easily ruined in this way. The matter of extreme colors should be discontinued entirely as soon as may be, and the breeder should have in view the bringing about of a uniformity of color in the sexes.

Yet it may be doubted whether we ever can produce Plymouth Rocks that shall tend invariably, to produce males as dark as the females, and females as light as the males. The old Black Java hen has been made too much of a scape-goat. There are, no doubt, instances in the animal kingdom where traits originally introduced through one sex tend to persist in that sex alone. But experiments in mating a Black Cochin Cock to an average American Dominique hen and rearing the products of the cross for three generations have proved that the *dark* pigment still appeared chiefly in the pullets rather than in the cockerels. This might have been expected in advance, because analogy teaches it. Nearly all our breeds whose plumage contains both light and dark feathers, or markings, naturally throw males whose color wil *average* lighter than that of the females. The hackle and saddle of the cock inclines to be lighter than

the corresponding portions of the hen and certain portions of his tail and wings contain relatively larger patches of white, which make his average color lighter than hers. For example S. P. Hamburgs, S. S. Hamburgs and Colored Dorkings.

Again, the Black Java cocks, like the Black Cochin males, tend towards light or golden saddles and hackles and the American Dominique males have the same tendency. Now as the Black Java and American Dominique males are both lighter than the respective females and as the Plymouth Rocks are based on these two breeds, will the time *ever* come when our Plymouth Rocks will average of the same color in both sexes?

PLYMOUTH ROCK CHICKS.

We need hardly go over the ground we have carefully examined in our previous books, and take those who would learn the best methods from raising chicks from the egg to maturity through the whole curriculum, for it may be found in our earlier works. There are, however, some points particularly worth notice in relation to the chicks of this breed that may well receive a moment's attention.

Of the care during the first few days after hatching, little need be said in the present treatise. At the expiration of that time, if any signs of unusual mortality show themselves it is worth while to institute a rigid search for the cause, for there always is a cause for these things. If the breeding stock and the eggs were favorable, and the management is right, chickens ought

not to die. Poultrymen ought not to expect, as a matter of course, mortality among their broods of any noticeable amount.

If parasitic vermin are making ravages, go for them with Carbolic Powder or Persian Insect Powder. If corn-meal dough has been the diet, and we are assured that it has not been given in too wet a state, and yet scours are noticed, a change from that to clabbered milk may be found a sovereign remedy. Should milk be not easily accessible, a few grains of red pepper or a little of the powder of the German Roup Pills, one sixth as much per head per day as is prescribed for adult fowls in the directions, will be found very efficacious. If on the other hand constipation becomes general, as it sometimes does, a diet of shorts or shorts and corn-meal, wet to a crumbly consistence, frequently removes the trouble.

At the age when broilers are beginning to be thought of, and the breeder's eye runs over his flock to cull out the least promising, the greatest care must be used in selection. We cannot now as we could but a few years ago, take all the black and leave all the gray ones, for blacks are few and far between nowadays, if the method of mating has been "half-way decent." We must use close inspection and the knowledge which past years have given us of the various changes which occur during the development of growing birds, to pick out the right ones. Many a chick that the uninitiated eye would call worthless will at maturity, when the brownish gray has given place to clear bars, be very good, while better marked birds have developed into disqualified specimens.

In making choice of birds for the table, fanciers often overlook one or two points that may serve as reliable guides. One of these is the breast-bone. How many breeders in selecting culls at this age look for a crooked breast-bone? Yet this is a serious blemish, and should summarily condemn any chick possessing it. In every flock there are more or less chicks thus deformed, and if we make these our first choice for the slaughter, we may well let others, with no irremediable failing, live a little longer.

Another thing to be looked after is the "pope's nose," which will determine the carriage of the tail and the value of the bird. If this is very evidently awry we need look for no other defects but condemn the fowl to the block. Weed out all the chicks with crooked bones anywhere, and the rest of the flock may well be granted a little longer lease of life.

The sex of the young stock, though it is not so readily ascertained as in other breeds, may be borne in mind in culling. A hen is a hen just as an egg is an egg, and though a poor Plymouth Rock cockerel is not worth his salt except for market, an inferior hen may be valuable as a sitter, if you have an out-of-the-way yard to keep such eyesores in. Even among the males we may make a distinction, using the very light ones and those with white wing or tail feathers for the table, before deciding upon the merits of the darker specimens. We might go on and give in their order the reasons which lead the careful breeder to a judicious choice in this all-important matter, but need hardly do so, for we

have said enough to show the possibilities of the subject and lead to the best of all knowledge, that acquired through the results of accurately-noted experiments.

In weeding out culls of this breed you must be very cautious and not condemn an immature bird too hastily on the ground of off-color in either plumage; legs or beak. The color of the feathers changes a great deal in the course of the growth of the young bird, so that specimens apparently the best turn out the worst oftentimes, and *vice versa.* As regards beak and legs, many a time the obnoxious willow or dusky tinge hangs on obstinately for months and then suddenly begins to disappear with great rapidity. Now that the popular methods of marking birds by means of punches and rings are in vogue, it will repay the careful breeder to set down in a book a description of doubtful birds at successive stages of their growth, and in this way learn by experience what changes to expect while specimens of certain characteristics are maturing. Refer to this book the next year, and in time you will learn which faults are commonly outgrown and which are irremediable.

SPORTS AMONG THE ROCKS.

Plymouth Rock fowls rarely throw what are known as "sports." Still such occurrences as the production of white chicks are sometimes heard of. It may be of interest to note the experience of a breeder as given in the *American Poultry Yard*, who says:

"I have in my possession a white Plymouth Rock chick, hatched the 15th of May. The eggs I set from

my own yard; there have been no other hens and no other cock in the yard but Plymouth Rocks. The chick is about as white as a White Leghorn, but the shape is the same as the rest of the Plymouth Rocks that were hatched out in the same nest. The cockerel from which the chick was bred is a fine one. If any one can tell where and how the chick became white, I would like to hear from him; for what I say in regard to it I know is true. Is this a sport?"

To this last query we are inclined to return a decided affirmative. Albino fowls are rarer than coal-black ones in all breeds, as far as our experience goes, but are by no means very uncommon. A black fowl of this breed, though it may be called a case of reversion, cannot properly be called a sport. It is rather a fowl that "throws back" to a distant ancestor. The time when every year brought a number of pure black pullets is too fresh in the breeders mind to allow such a term to be applied to it at present. Ten, or perhaps five years hence, the epithet may become current, but hardly before that time.

Sports occur in every breed even under the best management, and, we make no doubt, are as plenty in the Plymouth Rock tribe as in any other. The time may come when all breeds of fowls known to the *Standard* will be so perfect as to throw no sports, but when that happens the millenium will begin to loom like a ship in a fog. In fact, domestic fowls ought not to be expected to ever breed perfectly true to color. Wild species breed with great uniformity in this respect generally.

But the influences of domestication tend to break up and scatter the color in numerous directions.

COMBS.

This breed of fowls is generally acknowledged to be one of the most hardy and vigorous of all our domestic breeds, and is well fitted to stand the rigor of northern winters, if we except the single comb. In selecting breeding stock, both cocks and hens, it is advisable to use those, other points being equal, having rather small combs, well set on the head, not thin or inclined to lop. A small, thick, single comb will stand cold much better than one of the Leghorn style. The *Standard* requires a comb "rather small."

The experiment of attaching a pea-comb instead of a single one has been, we believe, tried in several instances with more or less success, and quite recently a breeder advertised Pea-combed Plymouth Rocks under the title of "re-improved." We have been unable, however, to obtain any reply to our inquiries as to how the pea-comb was obtained, and whether it is firmly fixed as a characteristic.

Whatever the success or failure of the experiment in this particular case, the desirability of a race of Pea-combed Plymouth Rocks is so evident that we may expect, in a very few years, a number of strains of the variety.

THE STANDARD AND THE ROCKS.

Hardly any breeders can be found who see in the autocratic pages of the *Standard of Excellence* just the

definitions they would place there. Yet this manual is so immensely superior to anything we have ever had before, that we may well be thankful for it, and find no fault with its matter relative to most breeds. For the Plymouth Rocks, however, we may claim an exceptional case, and a consquent exemption from the rule of—no grumbling.

This state of the case is due, primarily, to the fact that while our Games, Leghorns and Brahmas were well reduced by the harmonizing influence of years of breeding to an easily obtained general type, the Plymouth Rocks were in their first stages of development. In 1869, be it remembered, the first Plymouth Rocks were exhibited, the old line Rocks of course excepted, and but a very few years later their popularity made some standard necessary. Different breeders were doing their utmost to improve the breed, but their lack of unity made their progress toward their end something like the efforts of the workmen of the tower of Babel. So a *Standard* was made, though no one considered it as a perfect work or the exponent of the perfect fowl all were working for. From time to time slight changes were made as there was necessity for them, but much is yet to be desired.

Mating is the vexed point with the fancier, for months at a time, but we have a rule which is founded in experience and builds itself cumulatively from year to year. For matching, however, we must rely on the *Standard*, by which official ratings are determined, and here we find a discrepancy which surely ought not to go unquestioned. According to the practice and belief of the most expe-

rienced breeders, fowls matching in the show-pen must not only match as the *Standard* says they should, *i. e.*, in being equally well barred in plumage, but also must be, as nearly as possible, of the same degree of color. So universal is this belief, although the *Standard* nowhere so dictates, judges give precedence to the pair nearest the same shade of color over others as good, perhaps, in everything else.

It is easy to see that if the *Standard* is fully and completely right, judges and exhibitors are working a blind lead. This is one of those cases where no rigid rule can stand the weight of the common-sense opinion of the majority. If the mountain will not come to Mahomet, the latter must move to the more powerful body. The *Standard* is no idol which can have a Juggernautic power, but simply the exponent of the best opinion. When it ceases to be this a change must come.

Still we must make haste slowly and be sure we are on the right track before we step ahead. As regards the desirability of a clause in the *Standard* specifying that to be matched in color in the show-pen if is not necessary that the male should be as dark as the female, or stating that it is admissible that in a pair the specimen of one sex may be lighter than the other—if the majority of breeders favor such an amendment, we should join them most heartily, for, as we have said elsewhere in effect, we do not believe that nature intends the male of this breed to be dressed in as dark feathers as is the female.

In making the shape which one breeder has so loudly

advocated as the standard one, we may run directly counter to the views of many who have as good a right to their voice in the matter as any one. If we advocate a lowering of the prescribed weights, and an avoidance of all tendency to imitation of the Asiatics, we run full against a large faction. In short, the obstacles to hasty changes are many, and we can only hope for sure progress by "making haste slowly," and only making additions to our code as their necessity and feasibility are shown by full discussion.

EXERCISE.

There is enough blood of the lazy Asiatic poultry in the Rocks to make considerable tendency toward the development of internal fat and fatty degeneracy of constitution, hence the importance of securing exercise. As flight is forbidden to them, and limited ranges preclude roaming and the consequent exercise, our domestic fowls have, of necessity, to be provided for in some other way.

When they are confined within narrow limits, and have no room or chance to exercise themselves, they should be provided with the means of scratching. To do this advantageously, bury your grain beneath some dry rubbish, coal ashes, leaves, road dust or chaff, so that they will be compelled to use their feet in searching for the kernels. This agreeable and perfectly natural exercise gives warmth to the body, promotes digestion, and stimulates the secretions.

Inactivity is the bane of domestic fowls when restricted It predisposes them to listlessness, engenders vicious

habits and morbid desires, such as feather plucking, egg eating, etc. Hence, it is advisable to give your fowls all the exercise they will take. It stirs up the blood, keeps down internal fattening, and counteracts all tendencies to laziness, lousiness, and the consequent diseases which follow in their train.

These remarks are especially applicable to the larger breeds, as their quiet dispositions and gross size incline them to be inactive. Compel them to "be up and doing," and to *scratch* for their daily share of food, and you will find a marked difference in the looks, health and fertility of your fowls.

Winter, although considered a season of rest for domestic poultry, is manifestly detrimental to them in many ways. They are in a measure suddenly deprived of succulent green food, unctious morceaus of insects, the genial warmth of the sun, the freedom of range, the absence of calcerous matter, and other unconsidered trifles, which made up their summer bill of fare. Proper feeding and roomy quarters are indispensable to fowls at all seasons, but without plenty of exercise hens will not be healthy nor thrifty nor yield to the keeper a generous supply of eggs. If poulterers would exercise a little of their own judgment, and keep nature's ways constantly in view, they would find that every good laying hen is an inveterate scratcher, or active in some way or other and that by exercise their stocks would be vastly improved, confiding purchasers greatly benefited, and many millions of wealth annually added to the fowl interests of the country.

JUDGING.

We propose to show how the *Standard* should be applied to this breed, and shall begin with the A, B, C of the matter. The experts among our readers must remember that there are thousands of beginners who every year come upon the stage. We aim to instruct such, and to this end our artist has made a series of draw-

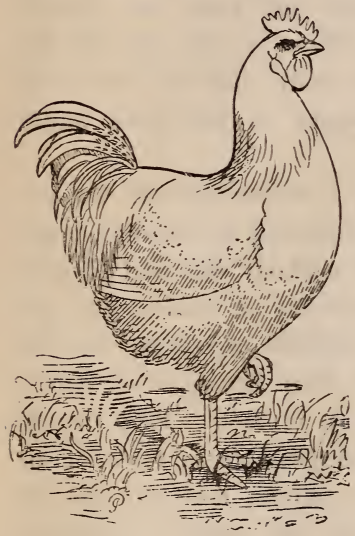


Fig. 1.

Fig. 2.

ings, illustrating the most glaring faults. We do not wish any of our readers to understand that such *extreme cases* of departure from the *Standard* as the cuts represent are *common* in the show room. Yet the failings illustrated are not absolutely *unknown* at exhibitions, since the originals of the drawings, with a few exceptions, were all found by our artist at shows, where they were sketched.

The novice should read this part of our treatise with a copy of the *Standard* before him, where he will find a numerical table, showing the 100 counts which are supposed to represent an *ideal* perfect bird. We doubt if a *real* perfect bird has yet been raised. The function of the judge is, therefore, to note how far each specimen falls below perfection. The pages of the *Standard* pre-

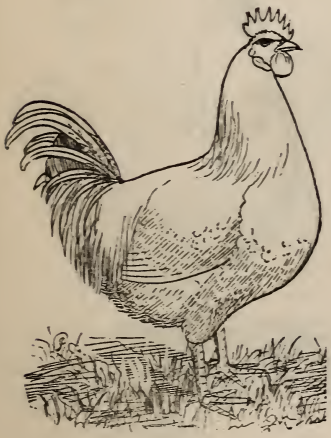


Fig. 3.

Fig. 4.

ceding the table explain each part of the fowl—as head, beak, neck, legs, etc., minutely. Let our novice look at the beginning of the table, and he will find that

SYMMETRY

is allowed 12 counts. But the 12 counts are for a *perfect* bird. If the judge finds that the particular bird he

is examining falls short of perfection in *symmetry*, he does not award it 12 counts, in making his report, but cuts it down to 11, or 10, or less, as the case may be. He proceeds in this way with *size and weight*, and so on through the table, and enters the whole number of counts the bird is entitled to upon his official report. The bird that gets the highest number of counts wins the first prize.

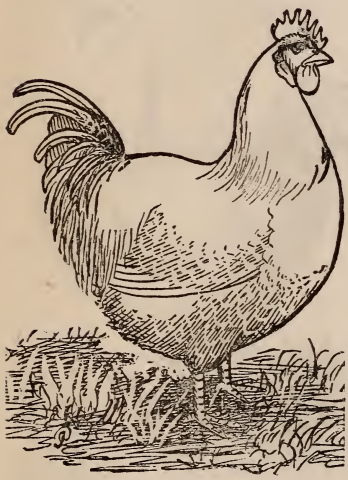


Fig. 5.

Fig. 6.

There are certain broad principles which the judge should keep in mind, in order to render justice. In cutting down for defects he should consider the proportion which the number of counts, or "*points*," he removes bears to the whole number of points under that head in the table. Thus, if "symmetry" in an imagined case is allowed 6 points in the table, and the judge cuts down

3 points, it takes away *one half*, and this is a heavy reduction: whereas, if symmetry is allowed 12 points in the table, in the case of some other breed, then a cut of 3 points is not so severe, relatively, because it takes away only *one quarter*. Again, the judge should not cut twice for the same fault. If the specimen has ill-shaped *wattles*, for instance, and the judge cuts him down under that head, he must not consider the shape of the wattles

Fig. 7.

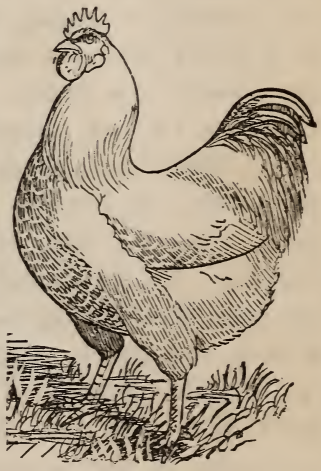


Fig. 8.

at all in cutting under the head of *symmetry*. Another thing should be observed in all judging: wherever several things are massed under one head (for example, "wattles and ear-lobes," in the Plymouth Rock table) the judge must fix the number of points the ideal *wattles* are entitled to, and the number due the ideal *ear-lobes*, otherwise he will be liable to do injustice in adjudging between competing specimens where sometimes good ear-lobes may

chance to accompany defective wattles, or *vice versa.* On this matter an experienced fancier writes as follows: "I like your idea of dividing, sub-dividing, and distributing the tabulated numerical part of the *Standard.* I always do this, mentally, in judging, but it should be discussed and explained in poultry literature until it is perfectly understood. It might seem like a work of supererogation to publish explanations of the proper methods of applying the *Standard* in judging, but it would be very useful." It is a pity that the sub-division was not made when the *Standard* was issued. However, each judge can subdivide for his own convenience in furthering justice.

We believe most judges pass upon symmetry and condition first. It certainly is best to decide upon these heads before the fowl has been ruffled or disturbed by handling. In considering symmetry of Plymouth Rocks, the judge should recognize that the breed has a *shape of its own*, and that in outline it should be neither Dominique, Cochin, Brahma, or Dorking. It should be *Plymouth Rock.* Our artist has aimed to show defects not excellences in the accompanying series of illustrations. We remark here that the cuts are not filled-in or shaded to show the markings of the feathers—*form*, not *color*, being under discussion just now. The Cochin shape is very frequently found. The lower part of the breast being deficient in the cock, gives an approximation to the Cochin form. Figs. 1 and 8 give variations of the Brahma outline; the first-mentioned also suggests the Cochin. Fig. 2 shows a specimen too leggy and long-necked. Sometimes the best birds are as elongated as

this when young, but "settle down" into good proportions after a while. Notwithstanding, a bird in this gawky stage should be cut severely in symmetry, or kept out of the show-room. Fig. 5 shows the other extreme, that is, legs too short, resembling those of the "Creeper" breed. Occasionally such a dumpy bird is found indicating over-fattening. Our artist has also shown, in fig. 5, the defect called "hog back," the shape of the back being convex, instead of straight, or slightly concave. See fig. 8, for the other extreme, the hollow of the back being too deep.

What is meant by a shape excessively like the Dorking is shown by fig. 6, the outline approaching the parallelogram indicated by the dotted lines. In the opinion of leading fanciers there should be considerable of the Dorking shape—but as remarked above our artist intended to show defects mainly, not merits, and therefore has illustrated extreme cases. A slight approximation to the parallelogram or Dorking style is all right. Figs. 3 and 4 show a milder degree of the Dorking shape; the former illustrating a very long-bodied fowl. Fig. 7 is of the Dorking shape, needing only the fifth toe and long sickle feathers to be complete. Our readers may see from the cuts that *symmetry* means the general outline of the bird, not the form of any particular member.

We pass by

SIZE AND WEIGHT,

as the actual trial of the scales and the "*suggestions to Judges*" in the *Standard*, make that part of judging as simple as weighing tea.

CONDITION

refers to health, and cleanliness, and perfection of the plumage. Health is shown by the vivid color of comb and wattles, the bloom or gloss of the plumage, and the alertness and general "wide-awakeativeness." The bird should be cut under this head if either too fat or too lean. Cleanliness needs no comment, since though the intrinsic value of a fowl may not be altered by dirt, yet it offends the eye, and destroys the attractiveness of the specimen. If feathers are torn and battered, the fowl loses under *Condition*, but not under "Symmetry," or any other head.

HEAD.

This, in the Plymouth Rock *Standard*, does not mean comb, or ear-lobes, or wattles, since they are provided for elsewhere. It means beak, and the crown of the head, principally, or the arch at the base of the comb, which mostly determines the shape of ihe head. Figs. 2, 8, 9 and 15 show this arch too flattened, also, a too narrow space above the eye. Fig. 11 gives a much better arch at the crown of the head and a good height of skull above the eye. Fig. 17, is a head too long horizontally, from right to left, giving a very awkward appearance.

Passing, next, to

COMB,

we notice certain principal faults, namely: a lopped comb' by which we mean one that falls over entirely, like that of a Leghorn hen; a twisted comb, fig. 10, that is, one

with a wavy outline, causing the points to appear out of a straight line, when viewed from the front; side springs, or branches, fig. 14; a dishing comb, by which we mean one that has a hollow in the side, as shown in fig. 10, where the dark-shaded portion indicates the depression. Of course, in a dishing comb, the concavity is accompanied by a corresponding bulge on the opposite side. Then there is the shapeless comb, fig. 13, simply a heterogeneous lump. Irregularity, in a less degree, is shown in figs. 12 and 16. Other varieties are the very low

Fig. 9.

Fig. 10.

Fig. 11.

comb, fig. 15, and the opposite extreme. Crooked tips are frequently seen, figs. 9 and 17. The faults in the cuts were designedly represented in an excessive degree. In a mild form all the defects we have described are very common in the show-room, for a good comb is the hardest thing to any breed upon any variety. For a lopped, twisted, sprigged, dished, shapeless, low, tall, or crescent-pointed comb, the judge should cut down ½, 1, 2, 3, or more, counts. Of course, if the defects are very glaring, the specimen may lose even more than this. If the bird unites several of these defects, and is cut a

point or two on each, he will justly lose half or two thirds of the full number, eight. Frequently a slight lop, and a slight twist, and slight side sprigs are combined. Many birds may therefore be justly cut from 3 to 5 on the comb.

We now come to

EAR-LOBES AND WATTLES,

the amount for which is 6. We will follow the custom of most judges, and consider that wattles should have 3,

Fig. 12.

Fig. 13.

Fig. 14.

and ear-lobes 3, on our ideal bird. The *Standard* defines the color of wattles as bright red, yet we opine that, if *pale*, the cutting should be done under the head of Condition. The allotment of the 3 possible points on wattles will then depend on size and shape. There is the large, coarse variety, which accompanies a coarse bird, and an opposite defect consists in the other extreme. Fig. 17 shows the defect of wattles of unequal length. This is a not very rare failing, which we have noticed on several occasions the past season at exhibitions, yet as it is not mentioned in the description of the comb in the *Stand-*

ard, the cutting must be done under the head of *Symmetry*. We frequently find the long, pendant wattles, fig. 9, or the wavy or folded variety, fig. 10, and for these faults the cutting may also be done under the head of Symmetry, provided the wattles are made unlike—that is, unsymmetrical—by the defects mentioned. As the *Standard* specifies that the wattles must be well rounded, of course the pointed variety, fig. 16; the elongated sort, figs. 9 and 17; the narrow, fig. 12; and the irregular, fig. 10, will be cut from 1 to 3 points, while the egg-shaped wattles fig.

Fig. 15.

Fig. 16.

Fig. 17.

14, or the purse-shaped, fig. 15, will fare much better. The ear-lobes may be cut for color. At least two of the three ideal points may be cut for the fault of whiteness. If slightly spotted, or edged with white, cut half a point; if moderately bad, cut one point. For too large ear-lobes, or too small ones, cut one half to one point. Most breeders prefer ear-lobes that are free from wrinkles, as if laid on smoothly, like a wafer on a letter, and the edges neatly rounded, but no attention should be shown to this in judging, as the *Standard* says noth-

ing about it. The *Standard* must be followed if it kills the horse.

We proceed to describe some of the principal faults of

THE TAIL

in Plymouth Rocks. Fig. 18 represents a tail which is too short for a full-grown cock, though it would do very well upon a cockerel, in which case mature sickle-feathers would nct be expected. Fig. 19 illustrates a tail with

Fig. 18.

Fig. 19.

sickle-feathers too long. Sometimes still larger tails are found in the show-room, giving the birds too much of a Dominique appearance. As a shape approximating the Dorking, *i. e.*, with a rather long and square body, grows in favor, the longer tails to correspond will be in vogue. A very bad fault is a tail which is too upright (fig. 20); and a squirrel tail (fig. 21). where the tail stands from its roots toward the birds head, is a still worse fault.

It must be remembered that if the specimen is cut down on account of a squirrel tail, or an upright tail,

or any other objectionable form or position, the tail must not be especially considered in deciding upon symmetry since the bird must not be cut twice for the same fault. Symmetry is not to be understood as referring to any particular member, but as signifying the general balance of parts. To illustrate, a coat may look well enough if hanging in a wardrobe; but if made for a short man it will look out of proportion if worn upon a tall individual.

Fig. 20.

Fig. 21.

The *Standard* mentions a wry tail as a disqualification, and disputes as to what a *wry tail* really is frequently arise at shows. It is no uncommon thing for a bird to carry the tail awry a part of the time, as a sort of freak or habit. A tendency will be found with some specimens to shake the tail or move it sidewise, for no particular purpose except "for the fun of it," as quadrupeds move their tails. If a bird is noticed to carry the tail perfectly true a part of the time, and upon examination the flesh and bone forming the foundation of that

member is true, it is not a *wry tail.* A wry tail is generally accompanied by a wry back or crooked rump, which is noticeable after the fowl is plucked for cooking. Of course there can be no cutting for a wry tail. If it is decided to be a wry tail, the specimen must be thrown out of competition altogether.

The judge should separate the possible number of points (6) into two parts; one part to apply to the *color* of the tail and the remainder to the *form.* Probably three for color and three for form would be a fair division. Then for the various faults of form enumerated above, viz.: a too long, or too short, or upright, or squirel tail, cut from one half point to three points, according as the fault is slight or prominent.

EXTRA WEIGHT.

It is safe to predict that when the contest over the proper method of mating to produce birds that will be alike prize-winners, and suitable breeding birds is over the next point for discussion will be that of extra weight. Already protests against the tendency of breeders of every variety to push for extra weight have been heard. They have been few in number, so far, but unless we mistake not, they are but the straws which show that the tide has turned and will soon be running swiftly.

It may seem strange that fanciers should individually be constantly striving to add a few ounces to the weight of their best birds when a little reflection must show them that all they can gain above the natural weight of the bird is an accumulation of internal fat.

It is, indeed, almost as suicidal to stuff our best stock to repletion as was it to slaughter the goose of golden egg fame. Of what use are noble specimens as breeders, save to start a strain of prize-deserving birds, and how can they do this when the pressure of internal fat makes the cock too sluggish to properly perform his duties and the hens too oppressed to lay?

In this matter it is safe to follow the old saying "let well enough alone," no matter how great the temptation to get the best of rival exhibitors on this score. We are ready enough to admit that the chances are in favor of the man who enters the heaviest birds, and that on the strength of premiums won eggs may be sold at an extra price. But, make a note of this, Plymouth Rock breeders—*it does not pay.* Eggs from overfed stock are a poor investment for any one, and for the breeder who sends them out the worst possible. Send out eggs from stock which has been "crammed to win" and what happens: First comes complaint of a poor hatch and a request for a second sitting, you duplicate the first order and wait a report, which, when it comes reads somewhat as follows: "DEAR SIR:—The second sitting you sent me resulted in three chicks. So I have now seven chicks for my trouble in hatching out two clutches. I paid you a good price and expected something nice; or at least good eggs. Your stock *must* be pure and vigorous with a vengeance! Next time I send to you for stock I shall know it.

Yours, *very* respectfully, JOHN SMITH."

Now what, primarily, has brought about this result? Not infertile eggs; not bad packing; but simply a strife

for extra weight that brings forth *imperfectly vitalized* eggs. There is no royal road toward increased size ln the best specimens of this breed, and when we endeavor to force nature's plans, though we may be apparently successful for a time, we but set going an agent that recoils on our own heads to certain damage.

When we get wise enough we shall know that the way to increase weight permanently is to select birds that weigh well when only moderately fat. Blood and bone and nerve and muscle carry the breeding power, and fat when present beyond a moderate quantity, is only an element of weakness. Besides, of what use is it to try so hard as many do to increase the weight of a breed? The average-sized specimen of any variety of our fowls is healthier, more active, productive and profitable than his over-sized brother.

POPULARITY.

It is a hard matter to decide which of the three most prominent breeds of the *Standard*, the Plymouth Rocks, Leghorns and Brahmas, can claim the greatest number of fanciers, but we may safely say that in this year of grace eighteen hundred and eighty, neither of the two latter has an appreciably larger or more thorough popularity than the Plymouth Rocks. Many a man has, to be sure, given up this breed, after a year or two of trial, because of the difficulty of breeding to nicety of plumage. But for every deserter of this sort there have been two who were attracted by the noble qualities of the fowl. To the genuine fancier the spice of uncertainty,

the probable possibilities (to coin a phrase), make the breeding of this variety a very entertaining study.

Apart from the attraction we have spoken of come still more solid arguments in the fertility and other good qualities of the breed, which appeal to the most positive test for ascertaining the value of any breed—the pocket of the breeder. Any breed that fails to pay its bills can meet but little permanent popularity; so, to invert the reasoning, we may feel sure that the popular breed is a paying breed. As surely as no system of ethics can live unless its rules gybe with common sense, so certainly can no type of fowls be perpetuated and held in high esteem unless its claims are founded on a common-sense, solid basis.

A FAIR AVERAGE.

The answer to the question, How many eggs will a hen lay? depends largely on the hen, the breed she is of, and a variety of other considerations too numerous to mention. It is almost like asking how many good-sized apples are in a bushel. In short, no definite answer can be given to such a hydra-headed query.

Ask a Cochin man, and he will say that the Cochins are the best layers, taking the year through. A Brahma man will say the same of his favorites, the Leghorn breeder of his fowls, and so on to the last fancier of the last variety.

Without going so far as a recent writer, who gives the Plymouth Rocks the palm as the most fecund of all breeds, we may justly claim a high average. Doubtless

in this, as in almost any fine breed, hens may be found that reach as high an egg record as two hundred yearly, but they are and must be exceptions to the rule. A fair average, one that the hens of a pure and well-kept flock may be relied upon to produce, is from one hundred and twenty to one hundred and fifty. No doubt by specially selecting the best layers and placing them under very favorable conditions, one hundred and seventy-five or one hundred and eighty might be made the figure. Yet this would be no real average, as it would represent not the average of the flock but of its best birds.

Breeders of limited experience are apt to expect too much in the way of egg production, and take little or no thought of the time necessary for incubation and moulting. All these necessary times of respite for the egg-producing organs must be fully summed up before we can get a true idea of the work we may expect.

It is worth while to remember that while in a state of wildness the progenitors of our Plymouth Rocks laid only as many eggs as were needed to keep the race alive. Since then, under the constant spur of man's tuition, they have increased the yearly work to ten times its original proportions, so that while it may not yet have reached its ultimate height, we are getting, in one hundred and thirty eggs a year, a very fair average.

WINTER LAYING

Though most fanciers begin to collect eggs for hatching in the latter part of January and the month of February, so that raising eggs for market hardly enters into

their calculations, fertility during the winter months is of prime importance. The demand of the buyer of mature stock is almost always for early hatched pullets. So thoroughly has the saw "early chickens early eggs, early eggs early chickens" become believed, that chicks from eggs laid in February and early March always command better prices than later and less perfectly developed ones. It is, then, a great point in favor of the Plymouth Rock that we can truly commend them to all breeders as first-class winter layers. Any breed will, of course, lay in winter if kept in the tropical climate of a green-house, but the Plymouth Rock hen needs no such special advantages to prove herself a good winter layer. With the ordinary conditions of house and runs which no poultryman would think of denying his stock, she fairly contests the place which the Asiatics have so long held in the popular mind.

Taking this matter of winter laying in its least profitable aspect—that of simply obtaining a sufficient supply of eggs for home use and marketing at the price of ordinary eggs, there is still a splendid exhibit in favor of the Plymouth Rock. Taking the average of all the eggs produced in a year, this breed may not surpass some of the non-sitting varieties, but for the *timely* production of eggs when eggs command a good price in the market they have few equals. To substantiate this assertion we might adduce hundreds of letters which have been sent us, but as they have mostly appeared in print in either the POULTRY WORLD or AMERICAN POULTRY YARD, we refer our readers to files of these papers, which are in

the hands of nearly all our fanciers. It may be worth while to remember that while all breeds of improved poultry are good layers, there is no equal ground which almost all reach and but few pass. There is as much difference as there is in blooded horses: all are fast but some much faster than others. The Plymouth Rock—to carry out the simile—is, in our opinion a member of the two-twenty class with many extra fine layers that make even a better record.

Give any birds kind and sensible care and adequate results will follow, but with the same advantages the Plymouth will make for itself a record that few breeds can equal and fewer still excel.

LA FLÉCHE.

HOW TO WIN

POULTRY PRIZES

By H. H. STODDARD

EDITOR OF "THE POULTRY WORLD" AND "THE AMERICAN POULTRY YARD." AUTHOR OF "AN EGG FARM," "BROWN LEGHORNS," "POULTRY ARCHITECTURE," "WHITE LEGHORNS," "PLYMOUTH ROCKS," ETC.

HARTFORD, CONN.
1879.

PREFACE.

MAN is combative, fond of emulation, and ever on the alert to possess something new. These peculiarities show themselves in various ways: sometimes in the display of dress or equipage, sometimes in trials of personal strength or endurance, and in other cases we see only a generous and good-natured competition about the possession of some desirable and useful article of property. This rivalry often causes genuine improvement in live stock, and results in benefit to all parties concerned.

A high civilization may unfit people for the enjoyment of a bull-fight, and any man with a cultivated intellect and good moral qualities will turn with disgust from a competition between men striving to "get outside" of the greatest number of eggs or oysters; but a refined and enlightened man may enjoy competition with others in the possession of the best horses, cattle or poultry.

We have written this book with special reference to those persons — increasing in number every year — who have a laudable desire to win prizes in our American Poultry Exhibitions, and to them we respectfully submit its pages.

How to Win Poultry Prizes.

THE annual poultry exhibition in this country has come to be an institution among us. This is comparatively a new thing, although it is now thirty years since the first public exhibition of the kind was held in America.

The first poultry show in England, of any prominence, was held at Birmingham, a year or two prior to our pioneer exhibition in the United States. *Now* these friendly competitive gatherings are held yearly, in both countries, in every State, county and district almost, where there dwell any considerable number of people.

And very agreeable entertainments they have proved, too, as well as profitable to the managers and contributors, and highly pleasing to the public generally, wherever they chance, from time to time, to be held. In so far as their effect upon the character of the domestic poultry now cultivated in this country is seen, a large and permanent improvement is manifest, as every one who is acquainted at all with what our poultry formerly was, and now is, will readily admit.

GROWTH OF POULTRY EXHIBITIONS.

Where there were a score of exhibitors, a few years since, there are now a hundred, at the least. Where in

former times but a few breeds of fowls could be shown (and these none of the best), we may now count our Standard recognized varieties by dozens.

And while in 1849–50 we had but two or three organized poultry societies, whose members made up the contributions to *all* the shows in those days held, we have now one hundred distinct and separate organizations in this country —each one of which has, within the past two or three years, held its yearly show of fine poultry stock, at various points of the country—in the East, West, Middle States and South.

There are presented at these fine exhibitions, from time to time, in the principal cities and large American towns, thousands of cages of elegantly-plumed and beautifully-formed fowls, that are the admiration and the wonder of crowds of citizens, who are *not* "chicken raisers," who gather in the spacious halls where these exhibits are held, to "see the wondrous sight;" and to learn there, for the first time, how innocent or how ignorant they have been, previously to these visits, of the true character of first-class modern poultry, as it is bred at the present day among us.

INFLUENCE OF THE SHOWS.

A quarter of a century since, a pair of young cockerels, dressed and marketed for roasters, that would weigh five or six pounds each, fatted for the spit, were a curiosity among the dealers in the shambles. Today, pairs of seven months old Light Brahma or Cochin cockerels, that draw each nine or ten pounds dressed, are a common thing in our markets everywhere. And the quality, too, has vastly improved, over that of the olden time. While the following

pages will be mostly devoted to the ornamental qualities of fowls, we could not refrain from saying what we have in favor of the fancier's influence, which, by increasing the interest in poultry, has placed upon the poor man's table, in increased quantity and better quality, at cheaper rates, a healthful, nutritious dish.

Five-and-twenty years ago we had the barn-yard breeds wandering about the farm—of all colors and descriptions—but mostly these were runts, and unsightly from their utter lack of uniformity in color, plumage or proportions. Now, we have our country places dotted over with clean-bred flocks of superb Light Brahmas, Cochins, great Dorkings, choicely-bred Games, fine Leghorns, showy Plymouth Rocks, beautiful Hamburgs, Polish and French fowls—all *new* in variety, and each a distinct breed, that is recognized by itself in our *Standard of Excellence*—and all of which have been bred and fostered by ambitious fanciers for years, with an eye to *exhibiting* their better specimens in competition for the liberal premiums offered by our societies at these modern poultry exhibitions.

The author of this book has, as a matter of business, already given ten of the best years of his life to bring about the existing prosperous and improved condition of things now referred to. And the public poultry exhibitions, working hand in hand with poultry literature, have accomplished the eminent success to which the poultry interest has now attained.

It is the object of this little volume to explain to the amateur, the novice, or the inexperienced breeder, how best he may operate with his favorite stock, and how he may in the easiest way manipulate his chosen fowls to bring

about the most desirable results in his attempts to rear exhibition birds.

GENERAL PRINCIPLES OF BREEDING.

It is only by a careful study of things which, at first thought, appear minute and unimportant, that the highest improvement may be attained in breeding.

The rearing of fine poultry is not in itself an insignificant matter; but there are many details, indispensable to success.

If a person starts on a journey, and the road is not familiar, he must needs make inquiry on the way, else have a chart or guide-book. To one who has not the advantage of experience and has not studied the matter, it may seem easy enough to breed high-class poultry. Says he: "Like produces like. If I procure a trio of Brahmas, Cochins or Spanish, give them good quarters, plenty of suitable feed, of course nature will attend to the breeding, and in due time I shall have a flock of fine chicks, like the original stock."

Many do this very thing, and are disappointed; not always, but in many instances. Why disappointed? Who will answer the question? The trio appeared fine—style, plumage, heads, combs, etc., superior. "Did you purchase the cock and hens of the same breeder?"

"Oh, no! It's against my principles to practice inbreeding. I purchased the cock of Mr. A., one of the most noted fanciers in the country. He has made a specialty of this breed for many years, and has taken the highest prizes at many of the principal exhibitions. I visited his yards, saw his stock, and there's no humbug

about it. His strain is excellent; and its excellence is the result of persistent patience and perseverance. I bought the hens of Mr. B., and he is scarcely less noted for his success; besides, those hens scored high. They are prize fowls. But the progeny is inferior in plumage, and there are marked defects in other respects.

"I paid a good price to start with, and I felt satisfied; felt willing to pay those two men for what I considered was the result of experience and wisdom on their part. And I supposed that I was starting with a double team, just at the point where Mr. A. and Mr. B. had arrived, having no doubt that I should win. But now I have receded, instead of holding my ground. Like a horse not caulked, on a slippery road, trying to go on, but sliding back. The case is similar to that of the Ethiopian poet:

> 'Sich a getting up stairs, nebber did see,
> Get up one stair and fall down three.'"

Let us study this case, and see if we can account for such peculiar, unexpected and untoward results. Facts have been discovered by naturalists which hit this nail on the head. When two breeds dissimilar in plumage and other characteristics are brought together or crossed, the progeny will in some of the number follow the male, a few the female, and many neither, but break up into splashes and patches of color, resembling both of the breeds, or unlike either. This leads us to an important topic, towit:

REVERSION.

All the "breeds" or varieties were made by selection. The race of fowls was, in the first place, made many-

colored by domestication, and from the tame mixed flock came the various breeds. Now, there is a tendency to revert back to what we will call the original domesticated flock every time you make a cross of the modern selected breeds. In other words, there is a *scattering*, when such cross is made, like the colors of a kaleidoscope. The reversion is most striking when two breeds very dissimilar in color are crossed; but the tendency to it is so strong, that when two strains of the same breed very similar to each other are united, as in the above case, false feathers will crop out through the influence of distant ancestry. It has been well proved, by many careful experiments, that the introduction of blood not akin gives a fresh impetus to the ineradicable tendency to take after remote progenitors.

Mr. A. had bred the cock pure; had kept for years within his own strain; had reared branches of the strain on his own grounds, or in other yards under his own control; had crossed and recrossed every year, establishing more firmly the standard markings, and every year sending out a greater number of meritorious birds. And Mr. B. had pursued the same course in producing the hens. Each breeder had a thoroughbred strain—the result of years—alike in standard points, yet not entirely alike in blood. In crossing these two strains the principle of reversion came in—though it had perhaps lain apparently dormant for generations—causing a black feather here, a white one there, and undesirable manifestations in other respects.

It is not asserted that a cross of two distinct strains will invariably produce these results. But there is a

liability of a considerable number of the progeny showing this effect of reversion. In some instances the cock might possess a remarkable degree of power, and overcome, by his procreative force, this tendency to revert, giving his chicks the peculiarities of his side of the house.

On the other hand, the peculiarities of the female side may be so strongly fixed by many years of systematic breeding, that the character of the progeny will mainly be determined by the hens. No doubt the more evenly balanced the mating in that quality commonly called prepotency, the greater the liability to reversion. It is a fallacy that the hen builds the house and the cock paints it. There is no such division of labor. It is a copartnership, into which both parties bring all the power, all the hereditary tendencies, active and dormant, of past generations. In one case the cock may predominate, and in another the hen in her line.

GROWING THE YOUNG STOCK.

Next to the judicious and proper mating of fowl stock, comes the method of growing the young birds properly, so that they shall prosper from the outset, and turn out the best of their class, when the time arrives for exhibiting.

The process of setting hens and hatching the chicks, we shall devote no space to in this treatise, for the reason that only the operator who is somewhat advanced in a knowledge of *these* ordinary details in fowl breeding should attempt the more difficult task of raising show birds. And if the poulterer has not previously acquired a familiarity with the first rudiments of chicken raising, he is not competent to undertake the other experiment.

Given the chickens hatched out safely, and we are ready to proceed to make the most of the younglings.

For six or eight weeks after their hatching no one can decide what the young birds may be at maturity. But, from the shell, whatever portion of the young stock is intended to be reared for exhibition birds, should be fed and managed with the nicest care. We have found that their first feed (for three or four weeks) is best if composed of *cooked* ingredients, invariably. Dry crumbs of stale bread, hard-boiled eggs, thoroughly boiled potatoes, and fine corn-meal—in equal parts—are an excellent aliment for the first month. This food should be given them half a dozen times in a day during this term. And if *milk* can be used, instead of water, to cook this food in, it will be much the better for them. Boiled rice and boiled whole wheat are also an admirable alternate dish. And *green* food of some kind, in constant supply, is a *desideratum.*

If the young birds are hatched out at the season of the year when the tender grass is starting, a run upon the greensward will improve them rapidly. When they are past four weeks of age, cooked meat and vegetables, mixed, may be given them daily, in small quantity, to great advantage.

During this early period the chicks must be kept absolutely exempt from vermin, or they can not thrive. This provision is all-important, be it observed. And the hen-mother should also be carefully watched, and constantly, too, in order that lice may not gather upon her body, and so be communicated to her brood.

By the end of the first or second month the sexes of

the chicks can be determined, and ordinarily the general color of the plumage can then be seen. The rapidity of development depends upon the breed. But with the Brahmas and Cochins we can not begin to cull the flock until they are three months old, or more. By that time the experienced fancier can decide very nearly how many prospective show birds he has been fortunate in securing, for the extra trouble he has been at, thus far in the year. In case of Plymouth Rocks "you can't most always sometimes tell" what they will make till four or five months.

Then follows the culling process. This should be done fearlessly. Out of a hundred chickens hatched, ordinarily twenty per cent. of the flock, or less, can only be counted on for future show birds. If but ten first-class fowls of a hundred can be brought up, that are prime specimens in all respects—in color, symmetry, good size, form and station—that wear a good (we won't say perfect) comb of their kind; that are well feathered upon the legs (if Brahmas or Cochins); that have neither hollow back, wry-tail, twisted wing-flights, high hip, show of vulture hock, spotted plumage, etc.—this proportion of the hundred will pay the raiser of such fowls very handsomely for his year's work. The other ninety chickens may be used, many of them, for breeders, and the rest will answer for table use satisfactorily.

From three months to six months old, the chickens hatched in March or April will come into warm weather well formed in size and in fine average condition; and during their first summer they will grow and thrive astonishingly, if cared for as we have herein recommended.

The one-fifth or one-tenth of the flock set aside as the finest and most promising for future use in the show-room, will henceforth require a continuance of extra attention; while the rest—that are not made broilers, roasters, or breeders of, as the case may be—can be allowed during the summer months, comparatively, to take care of themselves, if they can have unlimited range outside of their houses.

Your ten or fifteen prospective show chicks should every day be fed upon *system*, and with sound, nutritious food. They must not be *fattened*, however, at present. In the morning give them the warm cooked meal-and-potatoes mash. At noon cracked corn and whole wheat, or buckwheat occasionally. At night whole corn, with crushed bone and a small allowance of broken scraps—the latter not more than three times a week. Two or three times alternately in a week a dish of cooked coarse meat, such as harslets, or fish heads boiled up, will help their growth and aid digestion. And of *any* of all this variety of feed never throw before them more at a time than they will eat up clean. This plan saves unnecessary waste, and keeps the birds in by far the best condition.

Of course, it is understood that our fowls must be regularly supplied with fresh, pure water daily for drink. The allowance of milk also, in part, for the show birds, so long as it can be handily furnished them, will be a very good thing. They should have a roomy, dry, gravelly run, ample bath-boxes, and all this, of course. Without *these* provisions no fowls will keep in good health or grow well, however carefully they be fed and tended.

The author of these pages is aware that many readers

of his book will exclaim that "all this kind of attention and care *ought* to pay the man who bestows it upon his birds!" So it should. And so it will. But we are now writing of what we understand perfectly. And to such readers we say, with emphasis, it you desire to raise the very best fowls for exhibition purposes, and wish to own and show the choicest samples, in competition beside the contributions of our old fanciers of the present day, then you must thus attend to your work, and thoroughly, or you can not hope to be a winner among the crowd of well-posted breeders who do this very thing, year after year, as we have done it in past seasons, and as we now in detail recommend this method. What is worth doing at all, is worth doing well. No sloven can succeed with fowls.

"But all this entails a deal of trouble," urges another easy-goer. So it does, my friend. And if you expect to get on in this peculiar branch of fancy poultry raising *without* trouble, and labor, and thought, and care—from the day your chicks are hatched down to the hour when you ship them to the show, where you aim to win first and second prizes, nowadays—you entirely mistake your business, and should not attempt to "beat" your more active, enterprising, sensible neighbors, who *do* thus attend to the work, and who will continue, as hitherto, to carry off the palm you covet.

With this gentle reminder, in passing, we will now leave the three or four months old chicks to grow and flourish, under your care or that of your competitor, until fall, while we proceed further to point out "what we know about" the secrets of rearing show fowls to advantage.

CARE OF EXHIBITION FOWLS.

Show birds are always expected to be put before the public, when placed in competition, in their very best condition. And the measures necessary to bring the stock up to its highest state of perfection in beauty, cleanliness of plumage and general attractiveness, are quite legitimate, but are not in all cases so well understood by those who have good birds to show as these rules of preparation may and ought to be. We, therefore, propose to offer here some hints to the uninitiated on the subject of preparing to exhibit to the best possible advantage.

We take our selected birds—those which four or five months previously we picked from our flocks, for the purpose now in contemplation—and, from the score or less of these first-class samples, we *now* choose two or three pairs or trios which we intend to exhibit four or six weeks later in the season.

A special pen or house should be appropriated to the use of these birds for the next five or six weeks. The floor of this pen should be covered with clean dry sand two inches deep, and the birds should be allowed the most nutritious feed attainable, while they are now confined for a brief term.

The cocks must be kept by themselves, and the pullets also by themselves, during this term of preparation, in order that the plumage of both sexes may not be torn, ruffled, or disfigured. They should be supplied with clean fresh water every day, their premises should be thoroughly ventilated also constantly, and their food should be of sound grains, cooked meat and vegetables, with but little "green" feed (lest they scour); and at no time should

they be given more than they will eat up clean for the meal, since sour or stale feed is particularly injurious.

They must not be gorged, lest they grow fat and listless. They must not be over-fed, lest they get cloyed, and lose their needful appetite. But they should be furnished with *all* they will eat, regularly three times daily, and no more. Thus they will not lose in "condition"—an important consideration, when they come to be placed under the eye of the critical judge.

The best *staple* food we have ever known to be used at this brief period is rice boiled in milk, for one meal of soft feed daily. Whole wheat thus boiled is also excellent. Potatoes boiled and mashed with either of these grains—say, half-and-half—is best of all.

There are *no* kinds of seed like those of the *sunflower* for giving to the plumage the rich, brilliant gloss that is so attractive and beautiful in the show-pen. Hemp seed and buckwheat will help to effect this; but the sunflower's unctious composition seems much the best adapted for *this* purpose. But either of these oily seeds should be used with moderation, and but *a little* daily (with their dry grain feed) will be amply sufficient to effect the desired object, without causing a relaxing of the bowels, which trouble, under this high feeding, must always be guarded against with care. Feed meat sparingly.

FINAL PREPARATIONS.

The suggestions thus far offered in this work will apply generally to all kinds of fowls, and more especially to *white* or *light*-plumed birds. The principal object in placing these specimens in clean, dry quarters for a few

weeks just before show time is that their feathers shall first be purified from stains, or discolorations, and then kept perfectly clean until after exhibiting.

We have known White Leghorn and White Cochin fowls to be disqualified in the pens for showing "foul feathers," of a brownish or dusky hue, in small spots — which alleged false feathers were simply stains on the otherwise fair bodies of the birds, and were washed off after the decisions had been made and the judge had departed — in the presence of the executive committee, to whom the unlucky contributor appealed too late!

All this may be avoided, but it must be carefully attended to, or the delicately white plumage will quickly show the neglect to attend to this simple requirement.

Three days before the show opens in which you at last intend to enter your stock, the light-colored or white fowls may be *washed* all over, to advantage — if the owner knows how to do this. (See page 37 for full description).

HOW TO WIN PRIZES.

First of all, the way to insure the winning of premiums at fowl-shows, is to *deserve the awards.* If the plans we here describe are persistently and faithfully followed out, from inception to conclusion — the man who goes into the shows with such birds as he may in this way rear, *ought* to win.

But this does not always follow! And why?

We will come to that, gentle reader, by and by.

It is all-important that the fancier who aims to win the prizes should contribute first-class samples of the breeds he favors. The birds should be placed on exhibition

in their very best trim in all respects. The *American Standard of Excellence* should be his guide for the production of these birds, and he should breed up as nearly to perfection in symmetry, size, form, color, station and generally requisite points of superiority, as it is possible for him to attain in respect of the varieties he cultivates.

If he will accept our advice, we counsel him not to attempt to do too much. It is by far the better plan — and the chances are vastly in his favor, if he will believe and act upon this hint — that he should breed only one variety, and but a dozen or a score of these that are A 1 birds, than that he should attempt quantity before quality, and so achieve only mediocrity in all.

Breed *good* birds, then, if you can, and exhibit only such. Thus you may earn the coveted prizes.

CAGING FOR THE SHOWS.

The societies provide a uniform style of show-cage, at a nominal rental, for all who desire to be thus accommodated in the exhibition rooms. These cages are light, roomy and comfortable, and are very generally in use at the present day. If a contributor wishes to put into his cages a larger number of birds than these ordinary sized coops are arranged for — a "breeding-pen," for instance, or otherwise — his own taste will suggest the proper dimensions for this purpose. If cages are painted on the inside — for white-bodied birds a dark green or brown, and for dark-colored birds a pure white are the best tints to serve as a back-ground to "show off" the inmates of the coop to greatest advantage.

TRANSPORTATION TO THE HALLS.

Fowls almost universally are transported to the show-halls by express, over railroads. Largely, as it happens, our exhibitions are held in mid-winter — when the atmosphere is very cold. And here we must suggest caution in the method of shipping, lest the high, thin combs of many varieties — more especially cocks — will be frost-bitten *en route.*

Cover each coop entirely with coarse bagging, or thick cotton canvas, outside. If the fowls are to pass but a single night on the rail, this precaution is indispensable. If the weather is excessively cold, a sheet of coarse brown paper tacked on, *under* the canvas covering, upon three sides of the cage, will answer best as a protection against the insidious assaults of Jack Frost, while the fowls are going to and from the shows, in our bleak winter climate.

IN THE EXHIBITION ROOM.

Go to the shows yourself, or send a trusty man, in company with your stock, if this be convenient. You may confide in the proffered services of managers who offer in their printed schedules to "receive and care for all fowls consigned to their exhibitions in a faithful manner," etc., if you choose to do so. Many contributors adopt this course — and take their chances. The officials mean well, and they strive to do what they agree to do, usually, in this direction. But———

Well, we recommend every one who enters fine stock at our shows, anywhere, to be on the spot in person when his birds reach the hall. He will then know how well his contribution is cared for, and he (or his imme-

diate representative) may be able to choose a position in the hall more acceptable than *might* be accorded to his cages, were he but a small contributor and absent from the scene. It is fully "one-half the battle," oftentimes, in instances where sharp competition occurs, for the owners ofprime fowls to be "around when the ball opens!"

FEEDING THE BIRDS AT SHOWS.

Provision is made by all well-regulated poultry associations to feed, water and care for the stock contributed to their annual exhibitions, while the fowls are confined within their halls. If contributors are content with the bill of fare accorded by ordinary regulations, at such times, it is well. If not — and there are many who prefer to attend to all this themselves — then a card upon your coops requesting the attendants "*not* to feed these birds" will be complied with.

Generally speaking, the poultry have a goodly allowance of food — such as it is. But at very few shows do we meet with any provision by the managers for supplying the birds with gravel and green stuff, while they are cooped up for a week or ten days in a hot room, and then, if ever, *need* these things to assist their digestion of the dry, hard grains they are fed upon continually.

If these are not provided by the society, the humane owners of fowls should see to it, every day, that their pent-up fowls are supplied with cabbage-leaves or turnips, and clean gravel, with a little raw, lean beef in addition to their green feed. These will ward off sickness, in a great measure, and help to keep the birds in good condition for the time being.

JUDGES AT EXHIBITIONS.

These gentlemen have an irksome and disagreeable duty to perform, as a rule; and many of them, though they aim to do their level best in the *role* assigned them, fail to give satisfaction, and as frequently not only disappoint reasonable expectations, but compel the verdict that they are incompetent, prejudiced or partial in their decisions.

Now, this fact is patent, and we trust that no man, or men, will rise up and exclaim, "Is it *I?*" or, "Do you thus allude to *me*, Mr. Author?" because we now speak in very general terms, and intend no *personal* allusions to any one. Nevertheless, there is a *just* line of conduct for these arbiters to pursue; and, beyond this, there are the rights of the whole poultry fraternity involved, which we, as editor, and they, as umpires, are bound in honor to respect.

To illustrate our point, we recur to one instance that chanced to come under our notice at a show, not two years since.

There were on exhibition a few very fine cages of a certain popular variety, with one of the contributors in which class we entered into a brief chat, something in this wise:

"Mr. ———, you have a splendid trio or two of fowls here."

"Yes," he responded, modestly, "they are considered very fine."

"You ought to win with them, clearly. You've surely got the birds?"

"Yes, I reckon I've got the birds," he continued,

dubiously. And pointing to another coop near by, containing palpably inferior samples, he added, "I can't win, though. The other man yonder *has got the judge*, on this breed!"

And so it proved. The "other man" won first and second — as the humbler contributor predicted he would.

Judges are prone to overlook the real merits of certain contributions too often, when the fowls are *not* the property of officials, friends, partisans, or favorites. This is a shame. We speak of it because we are obliged to do so, and should speak of it oftener did we not dread the task so much. Some judges are prejudiced in favor of particular strains of stock that have deservedly won prizes for years. Some incline to favor certain fowls shown because they are known to be entered by some prominent breeder. Some will give the palm to the birds of an associate judge, who enters a variety different from his own birds which *he* contributes in that class, while he is himself the judge upon those entered by his fellow-judge. This is facetiously called the "You-tickle-me-and-I'll-tickle-you" system of "judging!"

There are other modes of beating the innocent and unpretending (but oftentimes meritorious) contributor, that are even less honorable and less equitable than are those we have mentioned. But we have not the appetite, even if we had the space, to pursue this theme now. We have but briefly referred to the wrong considered, with a view to put judges upon their guard against these unrighteous usages, and at the same time to inform the uninitiated what they may be called upon, perhaps, to contend with, from time to time.

The evils mentioned will correct themselves, no doubt, eventually. And, meanwhile, lesser contributors at the shows should "keep their eyes open," and continue to "put their best foot foremost," every time, in their efforts to win through indisputable merit. The day will come when all these abuses will be "played out." And the sooner this time arrives, the better will it be for all concerned.

AFTER THE EXHIBITION.

When all is over, and the lucky and unlucky competitors have learned the fate of their contributions, for the time being, let it not be forgotten that the fowls have been shut up in a hot hall for a number of days — or a week, it may be — and that they are now to be brought forth into the frigid night air, to be transported back to their owners' premises, perhaps with the thermometer ranging at, or several degrees below, zero.

This is a trying ordeal for any kind of fowls, and especially is it hazardous to the future well-being of the Leghorns, the Black Spanish, the Dorkings, the single-combed Cochins, the Plymouth Rocks, etc. If they have escaped freezing their combs during the first journey, now is the time to look out for the second period of jeopardy.

Cover the cages up carefully with the canvas or matting, as in the first instance, and get them all home into their comfortable quarters at the earliest hour possible after the show closes. Release them upon the earthy floor and watch what follows. Note how earnestly they go to burrowing in the sand. How busy they are in

picking out the gritty substances they find around them, and how eagerly they gulp down the particles of shell, flint and granite that they have been deprived of so long!

Feed them wisely now for a month at the least. If they are to be carried away in a week or two to some other distant exhibition — as winners usually are — the nicest care must be taken of them in the interim between the shows. If not, put the hens on a low diet for thirty days, commencing with their first feed after returning to their quarters.

Cooked bran and turnips mashed, for a morning feed, and oats and barley *only*, for dry food, for the following month. The fatty, meaty tissue you have forced upon them, in their prior five or six weeks extra feeding, must be reduced directly, or you get no eggs from them fit to set or for hatching, remember. And if these winners or show fowls are your *breeders*, they are in very poor plight (in this artificial condition) upon returning from the shows to furnish you with eggs suitable for incubating purposes.

RESTORATION AT LAST.

With all your efforts for their comfort and benefit, fowls that are exposed to the extremes of heat and cold in the halls and while upon the way, to and fro, will get ill, more or less. If they escape an attack of roup, diarrhœa, or canker — most common ails at such times among high-fed fowls — they will frequently exhibit lassitude, loss of appetite, effects of cold in the head or limbs, or other temporary troubles that call for careful treatment.

Into the drink supplied them now drop a pinch of ground ginger or cayenne pepper daily. Or, every other day, alternate these with a few drops of tincture of iron. Feed with their hot bran-mash a little "Egg-Food" twice a week — an excellent alterative — for a while.

Keep them in the sunshine now. Give them daily ventilation of their houses. Scatter fresh hay, cut short, around the floor for them to peck at. They will eat this eagerly. Chop up *cooked* meat and boiled fish occasionally to regale them with. But all the time *feed lightly*, until they come up well into their former natural, healthy, thrifty condition.

By the first of March all will be well again. Keep up the early matings. The hens will begin to lay more vigorously by this time. The eggs will be fertile.

> As the days begin to lengthen,
> And the warmth begins to strengthen,

the peep of the "coming winners" for another season may be heard from beneath the motherly sitter's wings, who has been busy for one-and-twenty days in her early spring duty.

Treat *these* new-comers as we have advised you to treat the last year's birds, now grown to maturity. If the latter have won the prizes you went for at the recent season's shows, you are lucky, and will find yourself rewarded for the pains dutifully and wisely taken to produce such superior stock.

If *not* — and you return home disappointed at being beaten by John, Thomas or William, on *this* occasion — then "up and at them *again!*" the coming year.

PARTRIDGE COCHINS.

The successful breeding of Partridge Cochins is certainly something very desirable to be attained. It does not require much thought on the part of the breeder who desires only large birds, to produce such, provided he secures his breeding stock from some of the well-known breeders (that produce large fowls without regard to matings). For such matings we should select large and good Cochin-shaped hens, which, placed with a cock with equally good Cochin shape, will produce all that we desire. But the poultry fancier of today, who has turned his attention to the beautiful Partridge Cochins, is not satisfied with the above result, and is aiming to show his brother fancier the modern Partridge Cochin that attracts so much attention in the show-room. To breed any variety to feather is a very great and difficult undertaking, and, if attained, will be the result of many years of careful study and watchfulness. We often see a breeder exhibit one very fine specimen, or perhaps a pair or trio of fine birds; but, after close questioning, we find that they were not his own breeding, but have been purchased from some celebrated fancier of long experience. We at once turn our attention from the exhibitor to the breeder who has shown such good judgment in his matings. The breeder that commands our respect is the man who can show us (as we visit his yards) a fine flock of both cockerels and pullets, *the get of the cock* that has been selected with great care. Partridge Cochins, by nearly all breeders, are considered the most difficult of all the parti-colored breeds to bring to the recognized show standard. This may be traced to the fact that the early Partridge

Cochin cocks were undoubtedly brown-breasted. The means of overcoming the great difficulty of breeding these beauties appear to be understood by some of our fanciers, but the great mass of breeders are wholly at a loss to know how to mate to produce the desired results, which are finely-colored cockerels and neatly-penciled pullets. To obtain the best results with this variety there must be two matings: one to produce males, and a different one for females, that will be approved by the present *Standard*. Many fanciers are not yet ready to admit this; but to our mind the following rules will hold good, if we really wish to obtain fine exhibition birds: if we desire to perfect a fine strain of cockerels, we should look first to the breeding-cock, and see that he possesses all the required Cochin characteristics—such as good symmetry; small and evenly-serrated comb; broad and beautiful saddle; fluff very full and abundant; wings that are well tucked up; tail carried very low (soft and free from any quill-feathers, if a possible thing); shanks and feet to be well feathered, and we must not for a moment overlook the middle toe, which must also be well feathered.

When we are fully assured that we have all of the above points, we must turn our attention to the color of the bird. Must have the breast, fluff and leg-feathering all solid black; the hackle should be a fine orange-red, and toward the front should be very dark; the saddle should be very much the same color; the stripe of both hackle and saddle feathers should be a jet black. The females for this yard should have small heads; combs that are small and fine; hackle to be a *rich* orange; ground-color to be a dark, handsome brown. A broad

and ample cushion is most to be desired, the penciling being a deeper brown, to be very fine, and to nearly cover the ground-color upon the breast and flat of the wings. The secondary quills will be very black; and it is well that the cushion be so dark as to be hardly distinguishable from black. White in the cock's tail or wings, or even in the feet feathering, must not be used in a yard for cockerels; nor should we use a cock with any white in our pullet yards. It will be necessary, in breeding pullets, to have quite a different type of bird — the cock for this pen should, of course, have the same Cochin characteristics as to symmetry, etc., as the yard for cockerels. We do not care to see fluff and breast a solid black, but rather prefer to have a good proportion of brown or red — think when the feathers are laced with red, it is much better than to have the whole feather of a solid brown or red — the hackle and saddle to be a bright, handsome orange (but not so dark as for cockerels), the dark red being a great objection in pullets as breeders. The females for this pen should have bright orange-colored *heads* and hackles, the dark color running well up upon the head; the hackles may vary somewhat. If she be an exhibition bird, it should be striped with solid black; but for a breeder it will not matter if it be quite well penciled; the ground-color of the body must be a handsome shade of light brown, or approaching a little toward the buff; the center of the breast and flat of the wing must be very accurately penciled with perfect semicircles so dark in color as to be discernible when standing some distance from the bird; the back should be well penciled, but we do not expect to find that even

penciling that we get upon the breast—the cushion to be well penciled, so as to nearly cover the ground-color; short secondary quill also to be well penciled. A pullet that is not penciled well up under the throat must not be expected to produce those that are. If we have the dark penciling and the handsome body-color that we have mentioned, such a mating can not fail to bring us good birds.

BUFF COCHINS.

have not gained in popularity in this country as rapidly as the variety of the Cochin group previously described. Yet, when well bred, their rich buff plumage is pleasing, if not so attractive as that of the Partridge Cochins.

The difficulties to be overcome in breeding are pale or faded feathers, white tail and depreciation in weight. A small, slender, weakly Cochin is an object not attractive, even if the plumage is unexceptionable.

We desire a full cushion, covering the tail almost completely, an abundant fluff, and legs standing well apart, as if sustaining great weight. They should look ponderous, if this expression is allowable in speaking of birds.

In mating, only specimens of good size should be used. The cock should have a full and rather dark buff color, especially on the tail and wings, and from the middle of the back, toward the tail, the body should be wide, carrying a very heavy saddle, and rising full-feathered and dome-like to the stern; tail-coverts chestnut, and the tail preferably a very dark chestnut. Thighs should be stout and well covered with rich buff color, extending in soft plumage down the outside of the shank and covering

the outside and middle toes. The saddle and lower part of hackle should have long-pointed, abundant plumage, with full buff color; and it should be borne in mind that any mealy appearance in the wings is very objectionable.

The breeding hens for such a cock should have rather small heads, combs and wattles, short necks, rich buff color; and for the rest, we should use the term *fullness*, in speaking of cushion, fluff and all the apparent plumage, not forgetting the full fledging of legs on outside and the middle toe. We need only to see a hint as to the whereabout of the tail.

It is not wise to use a Buff Cochin, of either sex, as breeder, that is faded in appearance. Such birds should be rejected without hesitation. A cock with black plumage in tail and wings, mated with standard hens, may produce valuable pullets. The objects in every mating should be to sustain color and size. In order to accomplish our purpose, the breeding stock should be two years old, and have held well to color—being well developed, yet not allowed to get over-fat. Such stock will produce chicks that will have better constitutions and attain a larger growth than those produced from younger birds. This remark is a trite one, applicable to all varieties of poultry.

WHITE COCHINS.

For many years this beautiful variety of Cochins, among the American fanciers, has been somewhat neglected. We suppose for no other reason than that the great care necessary for their fine appearance has, in the minds of

many, been the means of turning their attention toward the other varieties of this class. Owing a great deal to location, and in many cases to the soil in certain localities, the number of persons that can breed any variety of white fowls with success must be limited. Were not this the case, no variety of the Asiatics would have more enthusiastic admirers than the White Cochins. For many years we did not see the cocks showing that fine symmetry and beautiful carriage that is peculiar to the Buff and Partridge varieties, and in many yards they fell much below the Buff and Partridge in weight. Though we have often seen these objectionable points in the cocks, the females many times will surpass the other varieties in the beautiful points of cushion, fluff and feather. During the exhibition seasons of 1874–5–6–7–8–9 we have seen a very marked improvement in the number of Whites exhibited; not only have they been out in larger numbers, but the quality of the birds has been much superior to the former exhibitions. We feel that this is owing very largely to the efforts of a few of our leading fanciers of this variety, who have done so much to bring them to the point they so richly deserved in the show-room.

The large exhibits of Mr. W. T. Fenton, of Indianapolis, Ind., at the exhibitions of the Indiana State Society—also at the La Fayette Exhibition, and at the National Exhibition, held at Chicago, 1878—were very much admired by fanciers from all parts of the country, and we believe the gentleman has well earned the title of "White Cochin King of America." The cock Henry (3833), exhibited for several seasons past by Mr. Fenton,

has been pronounced by many of the best judges of this variety to be the best White Cochin cock ever exhibited in this country. We do not suppose there is a Cochin of any of the varieties that has taken so many premiums as this bird. While owned in Connecticut and exhibited by Mr. Geo. W. Mitchell, of Bristol, he was the first-premium bird at the Massachusetts State Show held at Boston, January, 1877; Central Connecticut, held at Bristol, December, 1876; Great Consolidated Exhibition of the New England Societies, held at Springfield, Mass., February, 1876; Western Massachusetts, held at Northampton, January, 1876. He was also the first-premium bird at the Connecticut State Show held at Hartford, January, 1878. Together with Mr. Fenton, we find J. J. Berry, of Hackensack, N. J.; M. I. Ellis, Norwood, Mass.; G. W. Mitchell, of Bristol, Conn., all of whom have done a great deal toward improving this beautiful variety.

For real beauty of plumage, there are but very few of the standard varieties of fowls that equal the Whites; and on a spring or summer day, as we look out upon a fine grass-run, there is nothing more gratifying than to see a fine flock of this variety. They at once strike the eye as beauties, and we often wonder why people that have fine village homes with beautiful grass lawns do not breed them simply as an ornament; for as the stranger, and even the neighbor, passes, they would be the one thing to be admired. Aside from the pure white plumage, there are many other points which this breed should possess. In these days of fine fowls we must have all the Cochin characteristics in this variety, as well as in the Buffs and Partridge. Clear white plumage is the

great thing to be aimed at; but young breeders will be very much disappointed in their young stock, if they do not study well the balance of the fine points required by the *Standard.* In choosing our breeding-cock, we must look well to the pure white plumage mentioned, for in visiting the different yards we will find that there are several shades of White in Cochins, and we must always be on the lookout to select the richest white; and should we desire to purchase old birds, we must see that they have retained the pure white after they have moulted, for we often find many cocks that will moult yellow on the back and wings. This is sometimes seen in the cockerels, and such birds should be at once cast to one side. Birds, either old or young, that are found marked with yellow in the hackle, share the same fate. After we have found the color desired, we must look well to the symmetry and general carriage of the cock. The head should be small, for so large a bird, and very fine; comb, small and perfectly straight and upright, firm on the head and well and evenly serrated; beak, short and stout and bright yellow in color; good, rich, flowing hackle; short, broad back, with a gentle rise from the middle thereof to the tail, and with saddle-feathers very abundant; breast and body, deep, broad and full; wings should be small, and well folded under the secondaries, so as to entirely cover the wings when closed; tail, broad and soft, and carried very low; shanks that are stout, short, yellow in color and wide apart, heavily feathered, and the middle toe also to be well feathered.

The hens and pullets are not so liable to be yellow about the back and wings, but still it will be found in

many yards that the color of plumage is not as would be desired for breeding. Always select such as are pure white, or your labor will be as good as lost, should you expect to get fine exhibition specimens from such yards.

Breeding-hens should be large in frame, the head should be small and neat; beak, short, stout, and rich yellow in color; comb, small and fine, with small and well-defined serrations; neck, short, the hackle-feathers reaching well over the shoulders; back, broad and the cushion rising from the middle thereof and partially covering the tail; breast, broad and carried rather low; body, broad, round and deep; wings, small and the primaries well folded under, the points well covered by the fluff; fluff, very abundant and soft, giving the bird a very deep appearance; legs and feet to be well feathered. same as the male bird.

In breeding fine exhibition birds it is always desirable to breed from birds that have moulted once; but if obliged to breed from cockerels, they should always be mated with old hens, and if we desire to use the pullets for breeders, they should be placed with yearling cocks. After writing on the subject of mating and rearing White Cochins, it seems very suitable to mention the methods and precautions necessary in the immediate preparation for the show-room. The remarks are applicable, not only to White Cochins, but to all other light-colored varieties. Indeed, birds of any color are all the better in appearance for being *clean.* Some soils give to white plumage a red tinge, somewhat the nature of a lye; but generally, soap and water will effect a cleansing. At this stage of our work we desire health and cleanliness.

The little white chicks are very beautiful, and are very much admired as they grow into larger birds and as the time approaches for the last moult of the season. The next object will be to keep them a pure, rich white; and in order to do this, they must be kept from the sun as much as possible. They should be placed in well-shaded runs, or given proper shelter of some kind. If not able to give them such runs as are desirable, the cock-birds should be driven into the fowl-house during the time the sun shines hottest, and it will be found that the fine white plumage will be very much better on birds that are so treated. At about this age of the chicks we find that the exhibition season is fast approaching and particular attention must be given to the feeding. Birds that have been penned up will need great care that they do not receive over-feed; it is always better to have a little appetite to spare. All the flesh that can be put upon a bird is not what is desired. We have known many fine fat Cochins that did not win in the show-room, simply for the reason that the competing birds, though smaller, were much better in condition of plumage. For several weeks previous to the exhibitions, soft food should be given for breakfast, also a little of the same at noon; a little chopped meat (cooked) should be given daily. Several times during the week a little linseed should be stewed and added to the soft food. A little hempseed given with the evening meal will also help to add luster to the plumage. Sulphate of iron should be given in the drinking-water, which will bring out nicely the red in the comb and wattles. Should not use the sulphate oftener than every other day. As far

as feeding is concerned, nothing more will be required, aside from the evening feed of grain and the green food that should be given every day. Rice, boiled in milk, given several times during the week previous to an exhibition, will do much to prevent purging.

After giving the birds the very best of care, they will not win with close competition if the plumage is not perfectly free from dirt, which should never be allowed upon any exhibition bird with which we expect to win.

The success of many of our noted fanciers has depended largely upon the excellent washing that their birds have received. We remember well hearing one noted breeder of Whites remark that he felt almost sure to win with them when in fine condition of plumage; and this confidence was obtained by first giving perfect attention to feeding and always washing the exhibition birds before each show. The washing should always be done from twelve to twenty-four hours before shipping the birds. Take an ordinary wash-tub that is large enough to take in the cock-birds without injury to the tail and that will give plenty of room for work. Fill the tub with warm water (not hot) so that the bird, when placed in the tub, will be covered on the back and well up on to the neck. Use pure white soap and rub in the water until you have a good suds. Then rub the bird well with the soap on all the dirty parts, which you will see very plainly when the bird is wet. Rub the feathers hard, as it will do them no harm as long as you do not rub hard enough to break them. After having cleaned the back and wings well, rub the

hand among the fluff and breast feathers. Do not try any half-way washing. Be sure that the bird is put well under the water, leaving only the head out. Have no fear for the tail or any part of the feathers, for they will all come right. Before the washing, provide a second tub, filled with clear, *cold* water, so that the bird will be covered same as in the tub of warm water. Do not be afraid of the cold water, for they will not take cold, as the cold water closes all of the pores of the body. When the bird is quite clean, place in the tub of cold water and rinse thoroughly, until you are sure the soap is all out of the feathers. With this part of the work great care must be taken; for if the soap is not all out, the feathers will not rub well.

After rinsing thoroughly, let them stand to drain awhile, then place in a coop and put them in a warm room to dry. It is well to place several birds in one coop, as the steam from the birds helps to keep warm. Do not place too near the stove, as they will blister their combs, after having been in the water; place them from two and one-half to four feet from the stove, according to the heat. In about one hour after washing, you will notice the feathers about the head have begun to web, and then the hackle-feathers will follow quickly. When birds are to be shipped the following day, we should recommend washing immediately after dinner, then the birds will be ready for the early morning trains. When you go out in the morning to look at your pets, the fine Cochin of yesterday will be almost a stranger to you, having improved so much in washing; and when the awards of the exhibition are made known, you will feel

more than repaid for your trouble. After reaching the exhibition, should you find any combs that are dull in color, give them a good rubbing with brandy, and the bright red will return again. Do not use vinegar, as the combs will turn dull again very soon. Should birds appear a little dumpish after washing, give one or two pepper-corns.

BLACK COCHINS.

are another of the self-colored varieties. Most of those at the present time grown in this country are faulty in plumage in considerable degree. It is a rare thing to meet with a brood of chickens of this breed that grow to maturity (especially the cockerels), that do not show patches or streaks of red or brassy feathers in hackles on saddles or wings.

This is a serious blemish; but it has been found very difficult—and in some strains impossible—to breed this imperfect color out of certain birds chosen for their good points otherwise. The *Standard* provides that the hackles should be "free from golden or reddish feathers," as also the back and wings. But the presence of these colors among the general black plumage is *not* set down as a disqualification.

To breed this variety at its best the clearest "metallic-black" fowls, of either sex, alone should be mated together. The less of golden and red feathers to be seen upon this fowl in the show-pens, the higher the scoring of such samples may be looked for among good judges of Black Cochins.

The same general directions in regard to size, build

and symmetry applicable to breeding stock of the other Cochin varieties will apply to the one now under consideration.

There is a *new* breed introduced into America, within the last two or three years, called the *Langshan* fowl—which derives its name from the province of Langshan, China, whence it comes into England, and thence into this country—which closely resembles the best Black Cochins we have here already, but which is a distinct species, or variety by itself, there is no doubt. But as the *Langshan* is a Chinese fowl, and as this breed has attained a most enviable notoriety in England and France within the past five years, we mention it here because of its close similarity to the Black Cochin in several of its leading features.

There are as yet but few Langshans in the United States, however; and this variety is not as yet recognized in the *American Standard* at all. So we merely mention it now; and with the brief assertion that those we have examined of this stock are very nicely plumed, clear-black birds throughout, of good size and proportions, and that they breed most accurately, so far as we have seen the young ones grown from the originals. We pass on to other topics, merely remarking that evidently the same rules, as regards plumage, will apply to them as to the Black Cochins.

LIGHT BRAHMAS.

In breeding this variety, or any other parti-colored fowl, it is the extreme of the two styles of feathering, dark or light, which must be brought appropriately in

combination to produce the average happy medium in color of cocks and pulllets among the succeeding chicks. This is what is meant by proper and judicious *mating*

If the Light Brahma cock or cockerel chosen as a breeder be a clear, white-bodied bird, for instance, with a full, well-defined *dark* hackle, black wing-flights and black tail, such a sire should be placed in connection with hens that are equally clean in body-color, but whose neck-hackles, wing-tips and tails are much *lighter* in the marking or penciling. And if the hens to be bred from are all *dark* hackled, and similarly on wings and tail, then the cock mated to them should wear the *light-feathered* hackle and the extreme white body-color, to be most appropriate to such hens.

It is time thrown away to attempt to breed even-colored and finely-penciled Light Brahma chickens from any other combination than that now described. Even by this method of mating *all* the chicks will not be so uniformly marked as we should like to have them. But through this means a majority of the chicks will be well marked, of both sexes; and the "culls" to be thrown aside on account of imperfect color, will be much less in numbers than results from the adoption of any other course within our experience.

In any case, the *sire's* appears to be the preponderating influence in breeding this variety. A well-formed, well-penciled, well-colored cock will impress his chief characteristics upon his progeny to a very large extent, whatever may be the character of the hens with which he may habitually consort. But for close, clean breeding, and for the reproduction of the highest quality in these

birds, the mothers should also possess well-defined and positive qualities of superiority as well.

The *time* to mate these fowls, with a view to attaining the better results, is in late winter — say, in January. The best *age* at which the sexes should be thus mated is when the pullets to be bred from are nine to ten months old, and these will turn out more satisfactorily if coupled with a two-year-old cock. If old hens are used, as before remarked in speaking of other breeds, a vigorous yearling cockerel will serve them advantageously, and the union should be made permanently in December, if convenient.

When your fowls are so selected and placed together in the breeding-runs, do not disturb the arrangements thus made, if you desire to succeed according to your best ambition. Changing the cocks from one pen of hens to another is not a wise method. If they are kept constantly together, in quiet, without introducing among them strange birds of either sex during the whole breeding season, they will do vastly better, and their eggs will hatch with much greater uniformity than they will when shifted about or experimented with in any way.

Eight or ten hens or pullets to one male Light Brahma will generally be found sufficient for the best results, yet the number varies with different cocks. If only a trio of hens are used, the majority of the chicks first hatched will prove to be male birds, as a rule. The larger the number of hens a cock associates with — within ordinary limits — the more pullet chickens are raised from their eggs, so far as we have observed, among the Asiatic varieties.

DARK BRAHMAS.

The mating of this breed is a nice operation, to produce exactly what is now aimed at by experienced fanciers. The *Standard of Excellence* provides that Dark Brahmas shall be "disqualified" by judges in the exhibition-pens, if they possess any of the following palpable defects, namely: Birds that do not match in the show-pen; those having a comb falling over, on either side; having crooked backs; wry-tails; twisted wing-feathers; legs not feathered outside the shanks, and to the extremties of the outer toes; vulture-hocks, etc. All these are absolute disqualifications.

Now, of the many average "good Dark Brahmas" which are carefully bred in the United States, from what is deemed reliably known stock, there are very few birds — more especially among the *cocks* shown for premiums — that are not blemished by some one or more of the above-designated defects. It is next to impossible to produce these birds completely free from some of these imperfections.

Still, it *is* accomplished, now and then. And the breeders we have referred to have been fortunate, frequently in placing in their show-coops, at our poultry exhibitions, superior specimens, that have deservedly proved winners, in the past seven years.

The pure steel-gray color in the *hens* of this class, entirely free from the brownish cast of plumage that crops out in the English-bred birds (imported into America since 1866–7), is the *true* color to be aimed for, in the genuine Dark Brahma. And the solid black-breasted *cock*, devoid of any brown or brassy feathers in saddle, hackles

or wing-coverts, is the ever-desirable thing for male birds of this species.

True it is, as we are well informed, that our *Standard* does not fix upon a discoloration of plumage the stigma of disqualification, explicitly. Yet in the enumeration or description of the requisite feathering of these birds, that *Standard* tells us that the different parts of their plumage shall be "black and silvery-white;" "black with an edging of white;" or "of a metallic or greenish-black, fringed at the edge with white," etc. No mention in the *Standard* is made of the *brown* feathers so often seen upon the bodies of hens and upon the rear flanks of cocks, which might well be pronounced a disqualification — in our mature judgment!

And wherefore?

Because the original "*Dark* Brahma" fowl — so named by Mr. Tegetmeier, high English authority — had no *brown* feathers in its composition; and the first that was ever seen of this blemish among the steel-gray feathering was found upon the early importations from England, after 1866, when the British fanciers had had time to introduce a cross of the Partridge Cochin upon those first sent out there from this country, for the purpose, as they have since admitted, of increasing their *size*.

But American breeders still cling to their "first love," in this respect. And it is the pride of our best fanciers to produce the "clear silver-gray" hen and the "solid black-breasted cock," in Dark Brahmas — which we deem a very laudable and sensible conviction on their part.

Another excrescence upon the English birds of this class, which is seen almost universally upon the first

year's product in this country after importing a trio, is the "vulture hock." This is properly declared in the *American Standard* a disqualification in the show-room. And both this and the mixture of brown feathering upon the hens' bodies and in the cocks' wings, to which we have now referred, should be strenuously avoided in our attempts at breeding prize Dark Brahma fowls.

To succeed in producing birds of this variety that are pretty sure to win at our exhihitions, we must begin with the cleanest stock-fowls that can be obtained. Such as are free from the stain of *brown* feathering in both cock and pullet, and such as also show no vestige of the "vulture-hock" upon their shanks, *only* should be selected for breeders. Any others are useless to risk for the raising of *show* birds.

The lighter the general hue of the plumage may be, if evenly penciled, upon the Dark Brahma hens or pullets, so that it does not merge into speckled or spotted gray, the better, usually, and the safer. Any shade or indication of bay or brownish plumage — however faint or indistinct — should cause such hen or pullet to be discarded at once and for ever, as a breeder.

As in the female, so in the sire. If the Dark Brahma cock shows the slightest traces of brown, red or "brassy" feathering across his wings, set him aside, as a *breeder*. You do not want him; and you can do better in your selection of a male bird. He should be clear, solid black-breasted, and black-flanked also. If the black, fluffy portion of the thighs are mottled with brown spotting, discard him, or the pullets coming after him will surely be brown-backed, seven out of every ten of them.

As to "penciling" or marking on the hens of this variety, there is a choice in every flock; although, as a rule, they will breed pretty accurately, so far as this feather-*marking* is concerned. A little careful observation in this direction will soon teach the breeder what is most desirable. The *Standard* requires the head of the Dark Brahma hen to be broad and neatly formed, beak horn-color; comb "pea" and small; neck-hackles silvery-white with each feather clearly striped with black, falling well down upon the shoulders. The cock should be "black on breast, or slightly mottled with white,"—says the *Standard* (not brown), and to this allowance we do not object, though we consider "solid black" preferable—and upon any other portion of the plumage only "silvery-white," or "dead black" is permissible.

To reproduce these colors in Dark Brahmas, we must discard all *others* mentioned. Choose, then, your sire and dam of the steel-gray and pronounced black and white plumage only. Treat the chicks as we have recommended the Light Brahmas to be treated. Select the choicest in size, color and form that you may find in your flocks, at three to four months old; cull out the imperfect ones—the deformed, the wry-tailed, the brown-stained, the false-combed, the knock-kneed, the vulture-hocked and the twisted-winged—of which, do your best, you will every season find more or less in some way defective—and put the rest upon their extra rations for the succeeding winter's show-pens.

And among the latter, if well tended and cared for, as we have suggested, you may have winners—or our advice as to their proper breeding is erroneous.

PLYMOUTH ROCKS.

In every yard of Plymouth Rocks the fowls are found varying in color, both cocks and hens. Among the former a very few are what would be called dark, a considerable number medium, and a large number light, or very light, so that they may be called light, as a rule. The hens are in greatly preponderating numbers, very dark, a few lighter, and a *very* few what might be called light, or about the same shade as a dark medium cockerel.

These light pullets and dark medium cockerels match in the pen, and from them are selected the exhibition birds. They are desirable, but few; being few, they are in great demand. Breeders wish to mate their stock in such manner as to produce the greatest number of these light-colored pullets.

Now, if a certain shade of color could be obtained by mating black with white, in fixed proportions, as the painter would mix pigments when making a paint to represent sky or clouds, there would be no difficulty. *The Standard of Excellence* calls for bluish-gray as the general color in both sexes of this breed. There appears three reversionary forces, all operating strongly to prevent uniformity in color: first, the ancestral black hen, on that side of the house — she stands braced back, and pulling with all might and main to make her descendants black or dark in plumage and with dark legs. People talk about different origins of this breed; no matter, it seems plain that a thoroughbred black hen is back of the breed, with a line stretching all the way down, and she controls the feathers of the pullets. She has yielded very much — has made a compromise with the Dominique male pro-

genitor in regard to color — yet she holds on to this reversionary influence strongly.

Next is the Dominique cock — the first cross. We can imagine him, a light-colored bird, braced back and pulling on the line of descent to make his cockerel descendants light colored, like himself. We can not find that he has changed in color a particle by the union. He was light colored when he commenced, and he is light colored now. He has only changed in size, shape and comb. The reason of this may be that male stock getters of light color have been generally used. Whereas, on the other side, all the black pullets have been thrown out, and the darkest pullets have not been used as breeders. Every year that our light cockerels are used in succession tends to *fix* the breed light on this side. Every year in which the lightest-colored pullets are used successively tends to *fix* a lighter shade on the female side. The light-colored cockerel and the black hen draw in opposite directions. Why can not the Plymouth Rocks be so changed by breeding as to approximate, and finally draw together?

This can only be accomplished by patience and effort in the right direction. It never will be done by persistently always using a light cock.

The change must be gradual. It will be advisable for the breeder to make three matings. In the first place, all the lightest cockerels and all the darkest pullets should be rejected as unfit to breed. Then much attention should be given to the color of legs. It is very important that a breeding cockerel should have not only legs yellow, but *very* yellow legs. The pullets at first can not be found in considerable numbers with pure yellow legs, but

After culling out all that show glaring imperfections, and those very light or very dark, take of the remainder those pullets that are the darkest and mate them with one of the lightest cockerels not near akin. This mating will not produce exhibition cockerels, and the majority of the pullets will be about the color of the dams—the lightest will be useful.

Then take those pullets a few shades lighter than those of the first mating and mate them with a medium colored cockerel. This mating will produce a good per cent. of standard chicks, more especially cockerels.

Lastly, place the lightest-colored pullets with a dark medium cockerel. In this mating the sexes are nearly of one color. Every breeder should make such a mating as this every year. We have conversed with several breeders who have made this practice without getting black chicks, and we think it is only by this system of mating that this breed may be rendered uniform in color. The mating of extreme colors should be discontinued entirely as soon as may be, and the breeder should have in view the bringing about a uniformity of color in the sexes.

There is another reversionary tendency, to which we have hinted, a tinge or color of brass and brown feathers. If a flock of Plymouth Rocks are permitted to breed indiscriminately, they will nearly all be affected by this impurity of plumage in a few years. The brassy and brown colors seem to come in easily, and it is only by selection that they may be kept out.

We are waiting for the coming Plymouth Rock cock, with dark medium plumage, distinctly marked, that shall have prepotency to stamp his color on his chicks,

especially of his own sex; a "Duke of York" that shall found a strain and crowd the light cockerels off the track. If the sexes are ever to breed uniform in color, it will undoubtedly be owing to some such extraordinary specimen of either sex. Some one may say, we must follow nature, Plymouth Rock cocks are naturally light. True, but nature sometimes appears to make a new departure in this business. A great many curious things have been done with feathers. Witness, also, the changes that have been already produced in our domestic poultry. And can we not vary the color of the Plymouth Rock cock? Mr. Darwin says: "When man is the selecting agent, we clearly see that the two elements of change (man and nature) are distinct; variability is in some manner excited, but it is the will of man which accumulates the variations in certain directions."

Aside from plumage, the symmetry, size, breast and body are made prominent in the *Standard of Excellence.* Symmetry is the fit proportion of parts. A Dorking may be symmetrical, also a Cochin, yet the two differ very materially in shape. Twelve points are assigned to symmetry in Plymouth Rocks. This is not for a Dorking shape or a Cochin shape, but a well-proportioned Plymouth Rock. Every year people are learning the distinctive shape of this breed. The chromos and engravings made to represent specimens help to fix true ideas of their shape or proper symmetry. It is not easy to write a description of the symmetry of this breed. One can better learn this at exhibitions, where the best specimens may be seen. It would be very bad policy to breed from a cock having a very long neck and short legs, or

having legs very long and standing near together. The comb is very liable to be crooked, carried too far back, pimply, or irregular in its serrations. A small comb, thick at the base, is apt to be free from faults, while a large comb is generally uneven, lopped, or has kinks and sprigs. These sprigs are only the reversion toward the rose-comb of the Dominique ancestry.

SILVER SPANGLED HAMBURGS.

All the varieties of Hamburgs, being rather small, and active in their habits, need considerable room for exercise; in fact a small breed of fowls need a larger space and better opportunity for exercise than those of larger size and slower movement. Lively birds do not stand close confinement well — pining, or, at least, showing the ill effect in general health. A large run may be desirable for any breed, but it is especially necessary for Hamburgs, if they are to show their very best condition.

If we select breeding stock, we want the birds in the very healthiest condition at the time of laying eggs. Such beautiful fowls, such fine layers, should not be stived up in very small quarters and suffer from neglect of cleanliness, a poor ventilation or none; for although they are delicate and beautiful, they are not proof against those ills that neglected fowls become heir to.

We will first mention some distinct parts or qualities that are common to the six varieties, and should be as nearly perfect as possible in every specimen, male or female, used for breeding.

All Hamburgs have rose-combs; and as this feature is prominent, those who are beginning to breed them should

have a clear idea of what a good rose-comb is, that they may not, in selecting breeders, unwittingly cultivate what would depreciate the value of their stock as breeders or show-birds.

It should be square in front, not bowing or irregular, neither jutting over the eyes. The proper color is bright red, as this indicates health and a rich, lively blood; and it should be firm, not slouching to one side, and it should be even, the points of equal height, with no depression in the middle. From the part directly above the eyes it should narrow back, terminating in a spike, only slightly inclined upward.

This description may answer for the combs of hens, except as they are comparatively small.

The ear-lobes of both sexes and all six varieties should be white, not semi-transparent, not hanging loosely, but fitting closely, and with the lower part nicely rounded; not large — the ear-lobes of the hens small. The wattles should not present a heavy appearance, but should be thin and handsomely rounded.

The form of our breeding-cock should be peculiarly graceful, with full breast, tapering neck carried well back, and having a flowing hackle, abundant tail-coverts and long, splendidly curved sickles.

Speaking now more particularly of the Silver Spangled variety, in selecting breeding-stock there should be careful attention given to the ground color, which should be pure white, free from yellow tinge or mossing. This pure silvery white should appear in all parts of the neck, breast and body.

And now for the ornamental markings of the cock.

The lower hackle-feathers and those of the saddle should both end with a black spangle, not necessarily sharply defined, but somewhat rayed in appearance; the plumage of the back, also, should have spangles of black on the end of each feather. These spangles are more apparent when feathers are examined separately, and the more firmly feathers are in their places, the better. Feathers loosely set on do not show the starry or rayed spangles to advantage. The feathers of the breast and body should each end with a large moon or spangle, round, greenish-black in color, sharply defined and separate to appearance. When the feathers on the breast do not hold their proper places, or when the spangles are oblong, they join each other in patches of black, thus injuring the appearance of the cock very materially. Aside from the symmetry of the bird, everything depends on the well-defined spangles in these parts, each feather firmly in its place. All the wing-feathers should end with a black spangle, those of the secondaries half-moon shape. The full-moon spangles of the wing-coverts are very important, as when in perfection of form and arrangement they present two distinct *bars* of greenish-black very pleasing to the eye. The tail-feathers on the outside, coming in view, pure white, with bold, large, well-defined greenish-black spangles at the tips; tail-coverts same, and sickles long, pure white and nicely curved, and with a black spangle at the tip.

A cock of this description, or as near to it as may be, matched with standard hens, is the best we can do in the way of mating. One cock may prove himself remarkable in producing finely-marked cockerels; another

may get valuable pullets. Such peculiarities, though they may be unaccountable, should be noted, and the same fowls used for breeding the succeeding year with the same mating. After the first annual moulting, the ground-color of this variety is very liable to become more or less tinged with yellow, but no bird should be used for breeding that is not well spangled in all parts, not excepting thighs and fluff. Legs, slate-blue, according to *Standard.*

GOLDEN SPANGLED HAMBURGS.

The Golden Spangled breeding-cock should have a hackle golden-bay, with a black stripe down the middle of each feather; back dark bay, each feather tipped with a black starry spangle; the color of the breast and body rich bay, each feather having a black, round spangle at the tip, said spangles not to overlap each other, but distinct, and showing the bay color between and without white edging; the wing-bow very dark bay, each feather with black spangle; wing-coverts with black spangles at the end of each feather, forming two regular and beautiful bars; primaries and secondaries, inner-webs black, outer-webs bay, the secondaries ending with a crescent of black; tail and sickle-feathers black, with greenish center, which should pervade all the color of the bird.

Such a cock mated with hens having ground color of golden-bay and with similar markings, especially regular wing-bars of such glossy black, is the best that can be done to produce desirable cockerels and pullets. If the ground-color of the back and wing-bows of the cock is very dark reddish-bay or maroon color, his male progeney will be most satisfactory.

GOLDEN PENCILED HAMBURGS.

The Golden Penciled Hamburg breeding-cock requires but a short description, being plain in his dress, compared with his spangled cousins. The tail should be black; sickle-feathers and tail-coverts black, each feather having a narrow, well-defined border of bay. The primaries reddish-bay on the outside web and black on inside The inside webs of the secondaries should be penciled with black — the whole plumage, except tail and wings, clear reddish-bay.

This brief description of the Golden Penciled cock will answer for the Silver Penciled, only substituting white for bay in the color. It is only necessary to mate with standard hens and breed a *large number* of chicks, in order to select birds for exhibition. The fancier having a good strain and great numbers to select from has the best prospect of success as a prize-winner. Only a small per cent. approach nearly to perfection, while the plumage of many will show mossing, lacing or marbling in the ground-colors.

WHITE HAMBURGS.

Of White Hamburgs we have only to mate standard specimens, avoiding those showing a yellow tinge in the plumage, which is a fault common to all white fowls, more or less, and in many cases is caused, or much aggravated, by exposure to hot sunshine. We refer the reader to our instructions in another part of this book with regard to the importance of careful preparation, by washing, of all white fowls intended for exhibition.

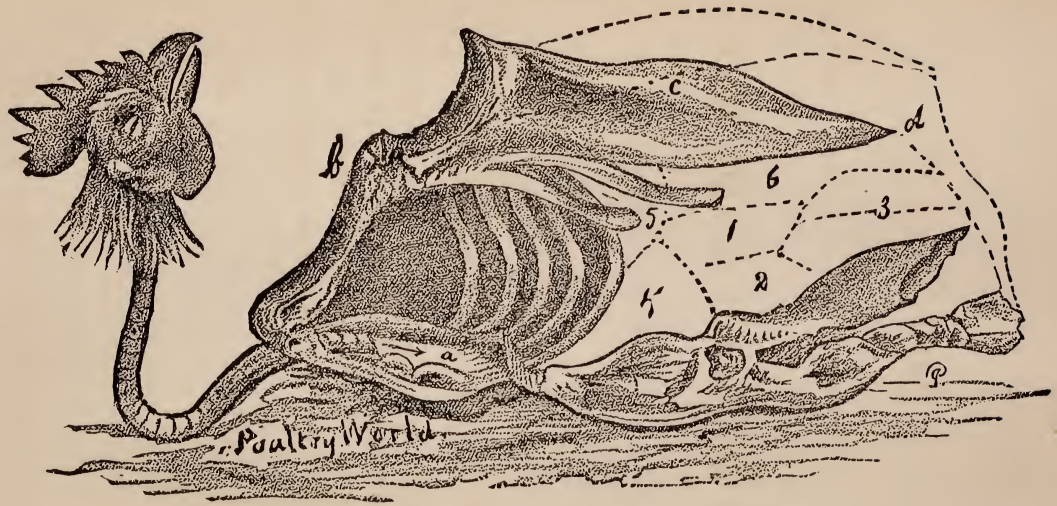
The legs of this variety are flesh-color.

BLACK HAMBURGS

exhibited at the shows have been larger than the other varieties, and in some instances of different shape, approaching nearly that of the Black Spanish, having longer legs and not being so full breasted. Narrow-breasted birds are apt to be squirrel-tailed.

Breeding-stock should have the true Hamburg shape.

The combs of Black Hamburgs are liable to be ill-shapen or loose, owing, probably, to Spanish blood formerly introduced for the purpose of securing white ear-lobes. In selecting breeders it is important to avoid white in the face, red feathers in the hackle or saddle and long legs.



This figure represents the apparatus of respiration of birds: *a* the solid lungs, which are not movable; *b c* the bones of the body, the breast bone, *c*, extending the whole length of the body; 1, 2, 3, 4, 5, 6, the air cells occupying the thorax and abdomen, which here form one cavity or series of cavities. These are dilated when the chest rises to the upper dotted line.

POULTRY DISEASES;

METHODS OF

PREVENTING AND CURING THEM.

BY H. H. STODDARD,

EDITOR OF "THE POULTRY WORLD," AND "THE AMERICAN POULTRY YARD." AUTHOR OF "AN EGG FARM," "POULTRY ARCHITECTURE," "BROWN LEGHORNS," "WHITE LEGHORNS," "HOW TO WIN POULTRY PRIZES," "PLYMOUTH ROCKS," ETC., ETC.

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PREFACE.

HUMANITY should be manifested in our treatment of domestic animals. The beasts of the field and the birds of the air show no pity, only viewing suffering with a stare and going away without having a chord of sympathy touched. Man can pity the galled horse, because he has reason and feeling, and he is also stirred to administer remedies to a sick animal by self-interest.

A book on poultry diseases should treat of their causes, and the best methods of prevention, for the reason that the methods of prevention may save not only the birds but very much trouble and regret on the part of the owner.

We believe that the sorrow which a person feels at the loss of a valuable bird, a pet, is proportionately much above the measure of regret felt at the loss of larger animals. Let not a critic find fault, and call this a small matter. The merciful man will be merciful to his birds.

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POULTRY DISEASES.

§ 1. The diseases to which poultry are liable are not many, when compared with the long list of ailments of the human species, yet those to which fowls are liable resemble, in great measure, those afflicting the human race; indeed, some of them are identical and require the same medicines and the same methods of treatment. Inflammation has a common cause, and the effects are similar in very many cases. The size of fowls and their constitution render necessary that a poultry keeper should know the proper medicine to administer, and the amount, which can only be ascertained by experience or analogy. There is no use in saying a word to the man who asserts that "fowls are not worth doctoring." Common dung-hill fowls are not valued highly, hence their ailments are not much noticed; but the improved, pure-bred poultry has a high value, and disorders are noticed and efforts made for a cure, and this fact undoubtedly gives rise to the impression that pure-bred poultry are more liable to disease than are mongrels. The most serious troubles are undoubtedly those due to roup, cholera, and vermin, two of which—roup and vermin—are multiform in

their symptoms. It will be found very necessary, however, for the one who is to treat these diseases to know something of the rest.

§ 2. Most of the diseases of poultry are preventable, and he who feeds, houses and cares for his flock properly, will have but little or no trouble, compared with the one who takes no pains in these particulars. Hence in every such manual as this, the subject of hygiene is all-important, and although not very many pages will be here devoted to the subject, yet the breeder may rest assured that those few pages are for him the most important part of the book.

HYGIENE.

§ 3. *Housing Space.*—A coop twelve feet square affords sufficient space for a flock of twenty-five, and a run of an acre is said to be large enough for a hundred. It must not be imagined, however, that for instance, ten times this amount of space is sufficient for ten times this number of birds. The poisonous air and the exhalations from the bodies and the evacuations of a very great number of fowls close together, cannot be combated by any influence. Sound policy, therefore, dictates the separation of your flock, if large, into divisions, each kept at some distance from the other.

§ 4. Nothing can be much more fatal to the success of the breeder than the violation of this rule against *overcrowding*. The bad air forms a fit soil for the development of the germs of disease, while at the same time the constitution of the fowl is so undermined as to

be unable to resist its assaults. It is in crowded hospitals and ships that malignant epidemics, such as typhus, malignant measles, and the like, make their appearance. This is quite as much the case with fowls as with men. Their blood circulates rapidly and therefore needs all the more rapid aeration.

§ 5. Closely connected with the subject of space is that of *ventilation.* A large fowl house imperfectly ventilated is as bad as a small and airy one. See to it that there are in your poultry house no corners where fetid vapors can lurk out of the reach of the free wind. We cannot, indeed, *see* the poisonous particles in the atmosphere, but they are there, and will as assuredly do their work as if they could be seen and handled. A fowl house should not, however, be exposed to too much or too sudden *cold.* Fowls will catch cold in a draught as readily as human beings, especially at night. On the other hand, fowls do not need a very hot place, unless the purpose be to stimulate the laying organs beyond what is natural.

§ 6. Strict *cleanliness* about the coop and houses is another necessity if epidemic diseases are to be avoided. And something more is meant now than the removal of the droppings. These, bad as they are if allowed to accumulate, are by no means the worst enemies to be encountered in a filthy fowl house. Worse than these are the unseen deposits on the walls, and also the vermin, lice, red mites, etc., that infest all badly kept coops, and suck the juices out of both the older and the younger fowls.

§ 7. The droppings should be removed. Dry earth, such as is the dust collected in the highway may be spread on the floor to catch and disinfect them, and there is nothing better than this. Muck, well dried, and powdered gypsum or land plaster is excellent for this purpose; as is coal ashes, and either of these substances thus used becomes a valuable manure. The floor should be frequently spaded up, and even carried off and fresh soil put in its place; the gardener will readily understand how to economize that removed.

§ 8. Especial measures should be taken to counteract the invisible dirt, namely the organic matter exhaled from the fowls' lungs and bodies, which settles upon the walls. partitions, nests, roosts, etc. Whitewash must be frequently applied. Carbolic acid, a fluid ounce to a gallon of water, should be thrown freely about all parts of the structure. And this may be also left to evaporate from the vessel containing it, or from old cloths or blankets wet with it, into the air of the poultry house, taking good care that the fowls do not eat it if it be left there in bulk. Hanging up, by the neck, an open bottle full of it is an excellent method.

§ 9. Hospital wards are purified in two ways: by exposing them to extreme cold or to a tremendous heat. Probably the partial immunity from cholera, etc., of poultry houses in the North is in part due to the bitter cold of some winter days. The practical deduction now is: if the weather becomes extremely cold, remove your fowls, if possible, throw the whole hennery open, and let it have a good thorough freeze; or, if your arrangements

allow of it, put in a stove occasionally and heat it as hot as you can get it; it is not probable, however, that this will do much good unless you can get it up to 150 deg. Fahrenheit, or something of the sort. Boiling hot water, thrown on in profuse quantities would be useful.

§ 10. Fumigation is very beneficial in protecting against both the germs of disease, and *lice*. Warren Leland appears to have shut up his poultry house and to have filled it with smoke. The smoke of sulphur, made by putting a piece of red-hot iron into a kettle containing it, is far better than common smoke. Let it remain shut up in the house several hours. Rosin is sometimes added to the sulphur. Tar or gas-tar is less good, but does very well if at hand, and shavings wet with carbolic acid, if burned in the hennery, will send out abundant fumes. If lice or red mites be the pest aimed at, remove also all the movable parts of the hen-house, such as the hay in the nests, perches, and so forth, and burn the litter and char the wood-work. If there has been an epidemic of cholera or roup, and the fancier can afford it, burn the whole hen-house, and if possible seek another locality. Movable poultry houses, as recommended in *Poultry Architecture*, are well worth the cost. An excellent plan is to smear the perches with soap-grease and scorch them with a lighted torch. That this needs caution goes without saying. Slacked lime may be put in the corners. A good wash is made with potash, one pound to the quart of hot water, following up with a free application of kerosene. Fumigation can be conveniently carried on by the use of wire baskets or grates. Whitewash for the inte-

rior is the neatest, best thing for all poultry-house woodwork.

§ 11. The house is not the only collecting place of poisonous exhalations. The *runs* should also be looked to, and the roosting places, when out of doors, and all places where fowls collect. Change the run if possible, for this purpose movable fences are useful [See *Poultry Architecture*]; at all events spade or plow them up frequently. Earth is a powerful absorbent of all such exhalations.

§ 12. *Light*, and that, too, the direct light of the sun, is absolutely necessary. Every animal is in a sense partly vegetable in constitution, and if you want to know how the want of sunlight will affect it, look at the pale potato sprouts in your cellar. If possible, have no nooks and corners that cannot get an *occasional* sun-bath. And yet, this is a good thing of which it is possible to have too much. Fowls need considerable shade, and a cool place is very desirable, especially at noon, on summer days, in the hottest weather.

§ 13. A few words on the subject of "*hospitals*" will be in place. When fowls are sick, particularly with roup and cholera, in order to prevent their being worried by the well fowls, they should have a place by themselves, and in the case of roup and cholera, these places should be very much more airy than usual. But, if possible, let these shelters be of a temporary nature, and do not use them again. A few old pieces of lumber knocked together, and afterwards burned will be best. Of course this is not always practicable. But fumigation or some

sort of disinfecting process should be resorted to before the hospital is used again when it has sheltered fowls affected with contagious disorders.

§ 14. The model poultry house should have at some seasons, as little wall as possible; twine netting makes an excellent partition. A roof is all that is needed for a poultry house in warm weather, the sides being worse than none.

§ 15. The *food* is of course a very important matter. The digestive system in all animals is important, but in the fowl, especially in laying fowls, the digestive organs are of prime importance, and the nervous system much less developed. Hens are practically manufacturers of food into eggs. On the subject of food it is quite possible to write a whole book, and we hope to issue such a treatise at no distant date. Here however, our remarks must be very limited, as we have only to indicate certain health aspects of the question, so that we must content ourselves with pointing out those articles which are particularly deleterious.

§ 16. Overfeeding leaves the blood full of material which will furnish a good seat for disease. Unhealthful articles are whole corn, in hot weather, all damaged grains, all offal when not perfectly fresh, all tainted meat, most very fatty articles, such as greaves, a too great quantity of green food, and too much meat, especially raw meat. Peas, beans, and pulse are too stimulating for general use, and not generally relished—proof enough of their unsuitableness. The objection to green food is not so much to the quantity, as to any sudden increase

in the quantity. This is apt to cause diarrhœa. If kept constantly before them it can do no harm. Any rotten and decayed article puts the system into such a condition as to be particularly accessible to choleratic diseases and roup. Various parasites also are found in it, also sometimes in green food; nevertheless the risk must be run in the latter case. Irregularity of feeding, whatever be the article given, is detrimental.

§ 17. The drink is also a matter of much consequence. Many attacks of cholera are due to foul and stagnant water, especially such as has filtered through stable manure. And even rain water after a single day's exposure, may be unwholesome. Anything but pure, fresh, cool water is objectionable. Not that stale or dirty water always induces disease, but it is liable to do this.

§ 18. We may mention briefly certain other deleterious influences which impair either the health or the pay rate of fowls. Too vigorous a male partner may cause debility, and also interfere with the perfection of the egg.

Long continued heats prostrate the system and render it more accessible to all disorders, especially choleratic. "Dry spells" are unfavorable. Rain in moderate amount seems to wash away the miasmatic accretions from the ground. Excessive cold also has its evil effects, and snow which stays unsually long seems to aid in developing certain forms of skin disease.

Confinement lowers all the functions, and is particularly favorable to the development of certain vices, such as feather eating.

Nervous excitement may injure even so low a species

as the hen. Exhibitions often work harm in this way. This subject is treated more at length in our work on White Leghorns [p. 42]. Fright always injures fowls.

Moulting is a trying period; the new feathers are so full of nitrogen as to make very rapid calls on the digestive powers of the fowl. Iron should be given, and rather more lean flesh than usual.

§ 19. Despite all care, however, and the close observation of all known hygienic precautions, a certain percentage of deaths must be expected and considered inevitable. This percentage will be, in fowls under three or four years, about five per cent.; more, of course, in older fowls, and more also, oftentimes, in fancy stock and thorough-breds than in common fowls, owing to the excessive in-breeding practiced by fanciers. If the percentage rises very high, the breeder should think seriously of renewing his breeding stock. Blooded animals have their vitality seriously diminished by the close confinement to which they are generally subjected, and degeneracy in point of health must be expected to occur more frequently among them. That the fault is, indeed, by no means always in the feeding, housing, etc., becomes evident when it is remembered that many eggs do not hatch, simply because the embryo did not mature. The egg, indeed, may have been properly fertilized, and the chick partly developed, but some inherent constitutional weakness prevented it from attaining full growth. If this happens before hatching, we must expect to find that many die while young, even where no fault can be found with the system pursued by the breeder after the chicks are hatched.

In-and-in breeding is often the source of trouble in this respect, and of course this will merely become worse by continuing to match your own fowls unless you have several breeding yards. Nature abhors incest. Over and over again we have urged this. Yet because temporary improvement in fixing desirable points follows close breeding, many of our veteran fanciers defend the practice, and in the end their stock is "improved off the face of the earth." The real source of improvement in horses, cattle, sheep, swine, dogs, fowls and all other domestic animals is the seizing upon by fanciers of some favorable variation which occurs suddenly and manifests itself in a superior individual (generally, though not always a male), possessing the power to stamp his impress on his progeny. That is, he is prepotent. Or, in other words he very distinctly "marks his stock after him." The close breeding that is generally the next step retains the excellences and multiplies numbers so long as the vitality holds out. For awhile in-and-in breeding loads our hands with good specimens. But by an inexorable law of nature the end is decay and ruin. For a time the decadence is not visible, because the new strain is so brimful of vitality that it is able to resist the deleterious influences of incest uncommonly well. The mainspring at the source of the river had a full head on and therefore the stream will not dry up for some time. The remarkably vigorous ancestor endowed the stock originally with so much strength that it takes five, ten, or twenty generations of close breeding to dissipate it.

DIAGNOSIS.

§ 20. Every breeder of any species of domestic animals and above all, the breeder of poultry, should be his own medical adviser. He must in any case depend altogether on himself. For, to say nothing of the expense of consulting a physician, an expense that in the case of fowls, puts it out of the question, he will find that very few of the medical fraternity know much of the health, condition, or anything at all about the disorders of his stock; they despise the whole subject, or where this is not the case, have rarely the time and patience to devote to the treatment of a sick fowl. Besides the whole safety of the poultry breeder, from a financial point of view, depends upon his keeping entirely clear of destructive epidemics; these he must learn to detect at their first approach, so that he can remedy the difficulty before the beginning disease has assumed a contagious and ravaging character. Many a fancier has given up, discouraged at the damage suffered from a run of roup or of cholera, when a little technical knowledge, such as we shall endeavor to give him, would have detected and checked the trouble at its earliest stage.

To get this ability, does not require a profound study of medicine,—if you have had this so much the better, —but here, as in most other things, many of the "practical points" lie on the surface, are easily acquired, and require mainly care and attention, with a knowledge of the structure, appearance and habits of fowls when in health.

This last is quite important. Most fanciers will, in-

deed, consider that they know their fowls well enough, but many a beginner does not. He ought to handle and study his stock, to learn the feel of good healthy muscle, the appearance and degree of moisture of the eye, the warmth of the skin, the look of the skin about the vent, the contour and position of the bones, the proper stiffness of the breast-bone and so on. If he has not acquired a sharp eye for these things his fowls may get quite ill before he finds it out. The knowledge of the appearance of the internal parts is not of much importance, but a knowledge of the right condition of the liver, the gizzard and the rest of the digestive organs, their shape, size and color, will sometimes settle the question as to the nature of a fatal disease.

Secondly, he ought to have some general knowledge of the whole subject of poultry diseases, and some particular details ready at hand, such as a careful perusal of this little book may give him. It is not needful that he should remember all that he reads, even professional men do not do that, but some details are to be remembered, others noted, and others hunted up when wanted. He ought to know well the subjects of general hygiene, and of several of the diseases of more insidious approach, at at all events, cholera and roup. He ought to know the outlines of the treatment, but not all the doses and details; these can be looked up at need.

In studying now the symptoms of disease in general, or any disease in particular, the main principle is that no one case is going to be exactly like another, and that no case therefore is going to be exactly as you find

it laid down in the books. A diseased body is like a machine out of repairs, there may be a little more of this wrong, or a little more of that, or a little of this and a little of that together. One wrong thing too brings on another in its train; what the observer must do is to find out the main or beginning trouble. Now whether he shall first treat the main trouble or some secondary one is not always a matter of rule. Generally you will at once direct your treatment at the main difficulty; but if your patient happens to be greatly exhausted, in consequence say of roup, you may find it better to stimulate a little, before you can give much roup medicine. For this reason, you cannot treat diseases exactly like a parrot, by following fixed rules, you will have to use some common sense in studying the symptoms, and try to discover what is the matter needing most attention just now.

Again, in examining a sick fowl, you must examine systematically, and not in a hap-hazard way, so that on finishing, you cannot say whether you have really examined the whole or not. Examine one organ after another, one function after another, in some regular and definite order, and assure yourself fully of the condition of each before proceeding to the examination of the next.

Sometimes some little study will be needed to make up the diagnosis, sometimes you can best make it by considering together the symptoms of several fowls attacked at once, sometimes you can arrive at a probable conclusion only by what is called the process of exclusion, by saying, "it is not this, it is not that, therefore

it must be thus and thus." Finally, when you cannot certainly ascertain the nature of the disease, you must turn your attention to removing anything that you may find wrong, as for instance lice, and sometimes you will find that this simple thing was, after all, the real cause of the malady.

The main difficulty in determining special diseases is likely to be met with in the case of roup and cholera, to detect these at their first approaches, and to discriminate between them and simple catarrh, or diarrhœa, or dysentery. This cannot, however, be certainly done, and the best method of proceeding is to instantly put suspected fowls by themselves, and especially if it be the season of the disease in question. Consumption also cannot be detected very early, if at all, but this is a matter of very much less consequence, as the disease is not contagious. Vermin also do damage sometimes to such an extent as to mislead the observer, who looks for some deeper-seated constitutional trouble.

Locally it is sometimes hard to discriminate between the various causes of lameness, particularly between a rheumatic or gouty bird, and one weak in the legs or paralytic.

Debility is a common symptom in many diseases, and also constitutes a disease by itself; the cause of it is often hard to discover. The various forms of debility frequently puzzle the student of diseases, as they embrace many different organs and functions.

Finally, inflammatory diseases of the crop, *proventriculus* and gizzard, do not give clear special indications; but these are not common, neither are they important.

MEDICINES AND THEIR ADMINISTRATION.

§ 21. All medicines are most easily given to animals in solution, but pills and other solids *will be swallowed if thrust far enough back in the mouth.* In doing this, remember the natural position of the hen's head in drinking, and keep the bill of the fowl pointed upwards and the neck stretched. This can be done by one person conveniently, if the left arm or elbow hold the fowl in the lap, while the bill is opened with the left hand. Give the dose slowly, in small quantities.

The *cheapest* way to get the medicines is to buy them in bulk. Then if you have not scales of your own which will weigh small quantities, get your druggist to weigh out a single grain, and keep this as a measure.

TABLE OF APOTHECARIES' WEIGHTS.

20 grains make one scruple.
3 scruples make one drachm.
8 drachms make one ounce.
12 ounces make one pound.

TABLE OF APOTHECARIES' MEASURES—FLUID MEASURES.

60 minims make one drachm.
8 drachms make one ounce.
16 ounces make one pint.

For rough measuring of fluids, it is considered that a teaspoon holds one fluid drachm; a tablespoon half a fluid ounce; and a wine-glass two fluid ounces. A drop is larger with some fluids than with others; water has about sixty drops to a teaspoonful or fluid drachm; laudanum (and all other tinctures and alcohols) has 120 drops to a

fluid drachm. But no such rough-and-ready method of measuring should be applied to such dangerous drugs as Tartar Emetic, Strychnine, Aconite and Colchicum. These, and Laudanum, are poisons, and should also be kept out of the way. Other drugs, which in some of their uses have proved dangerous to fowls, and therefore need to be carefully handled, are Sulphur, Kerosene, Carbolic Acid and Mercurial Ointment.

Fowls need large doses for such small animals. When you do not know how much of a medicine to give, ask your druggist how much is a dose for a child. Give a chicken a fortnight old as much in a day as would be given to a child six months old. A bird six weeks old needs as large a dose as a child of a year old, and a half-grown fowl as much as a two-year-old child, while an adult bird's dose is such as is proper for a child three or four years old.

Under each disease has been pointed out the proper drug for administration. Where a great many have been named, the first is commonly the best. Some few drugs need special mention here.

Tonics and Stomachics.—The best tonic is iron, a few drops of the tincture being mixed with the drinking water, or half a dozen rusty nails being thrown to the bottom of the drinking vessel. This is especially advisable during moulting. See also the Douglass mixture and chicken powders described further on.

Cayenne Pepper and *Asafoetida* are good digestive stimulants. So also is *Gentian. Ale* is a good general stimulant. In using Cayenne Pepper be careful to buy a

good article and do not use too much of it at once so as to disgust the fowls, nor continue the use of it long. *Asafoetida*, *Garlic* and *Onions* all have a good effect on the lungs and bronchia. Ginger will weaken the digestive organs if used too long.

Charcoal (and you can economically use the little bits of charred wood that remain after every wood fire), is a good purifier of the digestive organs, as it absorbs fetid matters; it stimulates digestion also. Furnish it in small pieces about the size of grains of corn; they will swallow it when they need it, particularly if some in a powdered state has been previously added to their soft food to teach them.

Sulphur is a very valuable drug to the poulterer, but should be used carefully in the case of young chicks, as many have been reported killed by its use externally and apparently more often when it is mixed with lard. The fine powder has also caused blindness by getting into the chicks' eyes. The flowers of sulphur are often contaminated with oil of vitriol; to get this out wash your sulphur carefully in hot water, which does not dissolve the sulphur. To apply it to small chickens sprinkle it from a dredging box and keep the chickens out of the wet for the next day. Persian Insect Powder is safer, however.

Lime water.—Four ounces of lime; water one gallon; slack the lime with a little of the water and pour on the rest. Cover and set aside for three hours; then pour off the clear liquid from the top, and use the lime that is left when wanted.

Douglass' Mixture.—Copperas one pound; dissolved in two gallons of water; then add, stirring well, an ounce of oil of vitriol; keep in jugs. This is a good tonic, in the dose of an ounce to a gallon of drinking water. twice or four times the week.

Chicken Powders.—Another Tonic.—Four ounces each of Copperas, Cayenne, Sulphur and Rosin; powder all; mix; two spoonsful for each dozen fowls several times weekly.

Another powder, said to be useful to turkeys before and during the *shooting the red*, is powder of cassia bark, three parts, ginger ten parts, gentian one part, anise one part, carbonate of iron five parts; mix well, and give for every twenty young turkeys, a teaspoonful twice a day, in the food. Begin two weeks before the appearance of the red and continue several weeks after.

Those wishing to administer homœopathic remedies can be supplied by some good pharmacy with all the pilules needed. Keep in mind in this form of treatment also the comparison already made between children and fowls, in determining the doses to be administered.

TREATMENT BY HOMŒOPATHY.

§ 22. We do not purpose to discuss the comparative merits of the homœopathic and other methods of treatment, but merely to point out, in order to make our treatise complete, the line of conduct that is adopted by the homœopathic school. Those who for any reason, whether from its alleged cheapness, from the different method of administering its medicines, or from belief in

its efficacy, prefer it, will find that we have indicated sufficiently the course which they will wish to pursue.

Homœopathy bases its plan of treatment on the principle that like cures like. It gives to the patient a drug which, in sufficiently large doses, would produce the same effect upon the system that the disease is producing. For instance, to cure diarrhœa, it gives a drug which, in large quantities, would set up a diarrhœal affection. It is not (and this is a practical point in choosing the medicine, since non-professionals are apt to suppose the contrary), merely the administration of smaller doses than those of the "regular school;" homœopathy gives small doses, but not necessarily of the same drug. One important difference is, that in using homœopathic medicines there is but one drug that it is considered right to use, and this you must select carefully; the "regular" practice may arrive at the same result by more than one road and therefore chooses between a number of medicines. In choosing the medicine, give that which corresponds to the main symptom of the disease, whatever that may be, disregarding all secondary or less important ones. If example, a fowl have severe roup and diarrhœa comes on as an accessory symptom, treat not the diarrhœa, but the disease starting in the beak or throat, the roup. If the disease changes its character, you must of course change your drug. Remember however, that the homœopaths think that the first sign of the favorable action of a medicine is to increase the severity of the symptoms of the disease. If two drugs seem to apply equally well to the case, and

neither perfectly, give them alternately. The doses are from one or two to seven little pills, according to the age of the fowl, given more or less often according to the greater or less degree of rapidity of the disease. One dose rarely cures. Very bad and rapidily progressive cases receive a dose even every half hour; very mild or slowly progressive cases not more than one or two a week. Dissolve enough of the pills in water so that a teaspoonful of it may contain your dose. The diet during treatment, must be altogether bland, containing nothing of a spicy nature. A great many diseases get well with no treatment at all; some will die with the best of treatment.

DISEASES OF THE THROAT AND AIR PASSAGES.

§ 23. *Roup* is a disease of the lining membrane of the beak, extending, however, to the whole head and throat, through the tear duct to the eye, and finally affecting the whole constitution. In fatal cases death ensues on three to eight days after the specific roup symptoms show themselves, and cases not treated are generally fatal whenever the malady appears as an epidemic in its severe form. After death the gall bladder and liver are found full of pus; the flesh has a bad odor and is soft, slimy and spongy, especially about the lungs. There are many other names under which this malady is often described; swelled eyes, diphtheria, sore head, hoarseness, bronchitis, asthma, snuffles, canker, blindness, influenza, sore throat, quinsy, etc., but some of these conditions may exist even when roup is not present.

The causes of roup, like the causes of cholera, do not all need special enumeration here. Anything that lowers the tone of the fowl (§ § 3–12), bad food, bad housing, lice, bad ventilation, filthy houses, etc. A very prominent cause, however, is exposure to cold and wet. So prominent is this, and so marked is the commencement of the disease at the beak, that it might almost be called malignant catarrh, and it is possibly nothing more. Influenza in the human being sometimes assumes a distinctive form, and fowls are sometimes destroyed by colds alone. Roup, therefore, is most common in Autumn and Winter, and where fowls are exposed to wet, cold draughts, and damp, sunless quarters.

The disease is contagious, from contact with the discharge, either when a diseased fowl touches another, or when a well fowl gets the discharge through the drinking fountain or otherwise. It can also, if brought into contact with the human eye, or with a wound or an abraded surface on the hand, cause serious inflammation, so that caution is needful in handling the fowl.

It has never been found, so far as we know, in any kind of wild fowl, though it may yet be discovered among wild birds. It attacks all ages, preferably the older birds, and may run rapidly or slowly. It also kills ducklings and turkey poults, though rarely.

Symptoms.—It may come on suddenly, or slowly, with previous signs of general debility, moping, etc. The first signs are those of catarrh or cold in the head; dry cough and dull wheezing. Much fever; the fowl drinks eagerly. The comb and wattles may be pale or dark colored. The

cold grows worse. There is a yellowish discharge, thin and watery at first, which grows thicker and thicker, and fills—in severe cases—throat, nostrils and eyes, the latter being closed and swollen even to the size of a walnut and the sides of the face may swell up. Pustules form all about the head and in the gullet, and discharge a frothy pus. The crop is generally swollen, though not always. The blinded fowl can not see to eat or drink, and this hastens the fatal end. The discharge has a bad odor, and this is *the one most distinctive symptom* of the roup. The clogging of the nostrils also seriously impedes the breathing. In all this, there does not seem to be any trace of special poison; it is like a typhoid influenza.

One of the best means of detecting the approach of roup is to lift the wing of the suspected bird and see if there is not a spot there where the feathers are smeared with a discharge from the beak, which has rubbed off when the bird has put its head under its wing at night. Also invariably look at the nostrils and see if they are clean and free from the slightest clogging. Go the rounds at night with a lantern and inspect your birds. Listen then for rattling or sneezing.

Treatment.—First and foremost, put the diseased fowls by themselves, if possible, each one separately, and as to cleaning, etc., proceed exactly as recommended in the treatment of cholera. Take all possible means to prevent any of the discharge coming in contact with any other fowl, which renders thorough purification of the drinking vessels, etc., necessary. Some preparation of carbolic acid

is good for this purpose. Give warm, stimulating food, house in a warm, dry place, with a sandy bottom.

Various plans are followed for the internal treatment of the sick fowl, most of which are often successful. A mild purge at the beginning, as for instance a spoonful of castor oil is advisable.

The best thing known anywhere for the roup is the *German Roup Pills*, Kunkle's original recipe, of which the author of this book is the sole proprietor in the Uuited States. This roup medicine has been before the poultry fraternity of America longer than any other, and is fully entitled to the distinction of *well tried and approved.* There is no danger in its use. Its efficacy is not impaired by keeping, whether the box is kept closed or not. It is convenient to administer, and its cost is not high· Since introduced in this country there have been several imitations under various names. Look out for them. The German Roup Pills will cure the roup whenever and wherever anything will. If anybody says he has a medicine that will cure all cases of roup in the malignant form, please present him with our compliments and *tell him he lies.*

In addition to the above, some stimulants, such as mustard or pulverised ginger in pills as large as a pea, given thrice daily, with cayenne pepper in the food and water. The rule for pepper in the soft food is to season as strongly as if for human food; in the drink, make as strong as your own "pepper tea." Dr. Bennett recommends, thrice a day, a pill of the size of a hazelnut made of equal parts of pulverized sulphur, powdered

charcoal and new yeast. To this must be added the mustard, etc., stimulants. Powdered charcoal should be added freely to the soft food always in this disease. It purifies the digestive organs against the foul matter in the throat which the patient is obliged to swallow. In any plan of treatment, if the disease runs several days, the purge should be repeated.

Besides the dosing, the eyes, throat and face must be carefully attended to. "Wash the head thoroughly with castile soap-suds," or better, with Labarraque's Solution of Chlorinated Soda, mixed with two parts of water, several times a day if there be much discharge.

If the throat be clogged *with the secretion*, clear it out and use the *chl. sod.* here also, applying it with a camel's-hair brush. The swelling of the eyes may generally be reduced by patient bathing, but sometimes an operation is necessary to remove the cheesey lump of hardened secretion. Simply open with a sharp knife and remove the deposit. Nitric acid, applied with a feather into the nostril twice or thrice, is sometimes used, taking off the old scab at each application.

Do not be in a hurry to return the fowl, after recovery, to the flock; keep it on some tonic for a time.

§ 24. *Catarrh.*—A slight cold with discharge from the eyes and nose. Putting the fowl in a warm place ought to cure. Wright adds to this three drops of No. 1 Tincture of Aconite in half a pint of the drink. Look sharp for roup when you see a catarrh, and immediate isolation of the affected fowl is advisable. Feed on soft, warm food. Four drops tincture of aconite in the water,

will allay the fever. The homœopaths treat light cases with *Mercur. vivus;* more serious ones with *Euphrasia*, each thrice daily, and add the aconite for the fever. Catarrh may pass into or unite with roup.

§ 25. *Bronchitis*, is really an aggravated catarrh, and shows itself by cough. Put the fowl into a dry and warm place, and give sweetened water slightly soured with sulphuric and nitric acid. For both catarrh and bronchitis, some stomach stimulant such as cayenne or ginger may hasten recovery.

Both catarrh and bronchitis sometimes cause death. But how are we to know such cases from roup? Simply by the offensive discharge at the beak which characterizes the latter disease. When the fowl has a discharge at the beak that is not offensive, you may call it a simple catarrh or common cold. When the odor is bad it is roup. No better distinction is possible in the present state of knowledge of fowl ailments. Give the German roup pills in either case. There is hardly a fowl ail to which this medicine is not applicable, as they are a serviceable tonic.

§ 26. *Cough* may also come from parasites in the air passages. This applies more particularly to the sneezing effort caused by the gape-worm in the throat of young chickens.

§ 27. *Consumption*, or tubercular deposit, may be suspected where a cough does not yield to treatment, and admits of no other explanation. Cod-liver oil in barley-meal would be the treatment, if any one really wanted to save a consumptive fowl. It ought to be killed.

§ 28. *Asthma.*—This is nothing else than roup as far as we know, and very likely this name may have been given to cases of that sort..

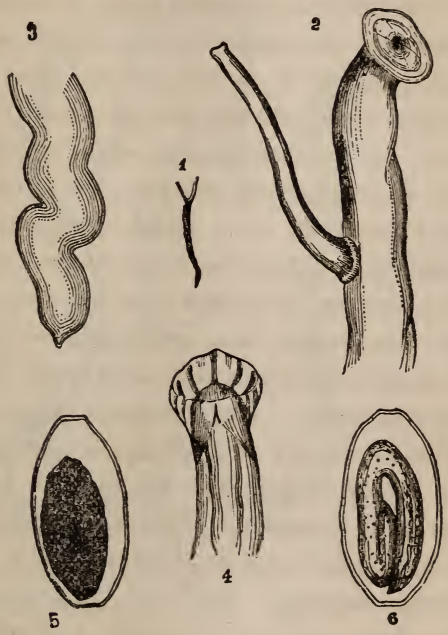
GAPES.

§ 29. *Gapes* is the expressive name, derived from the chief symptom, of a disease which chiefly attacks the younger chickens. It it a disease that has long been known, as the fowls affected with it give such unmistakable signs of its presence. It is due to the presence, in the windpipe, of a parasitic worm, called simply the "gape worm," or, in scientific language, *syngamus trachaelis*, or by some naturalists *sclerostoma syngamus.* It is not found in the hen alone, but occurs also in the turkey, duck and all domestic birds, besides various wild species, as the, "partridge, pheasant, lapwing, black stork, magpie, hooded crow, green wood-pecker, starling and swift." [This list is quoted from English authorities, and these birds are not in all cases the same as those known by this name in America.] Dr. Andrew Wisenthal, of Baltimore, in 1797, appears to have first published an account of the malady.

The fully-developed worms are found, as already stated in the windpipe. They are of a pale, reddish color. The female is about five eighths of an inch long and one thirty-fifth of an inch thick; the male only one eighth of an inch long and about one fiftieth thick. But the two sexes are always found united, the male being attached to the female far enough down so that the heads are about on a level, making a figure not unlike a two-

tined hay-fork, with a rather short handle. Fig. 1 shows the two, life size, and fig. 2 the upper portions of the pair magnified. The head of the female is much larger than that of the male, and has six lips.

Dr. Spencer Cobbold describes it as follows: "In both



GAPE WORM AND EGGS.

sexes the surface of the body is quite smooth, but the female displays a series of spirally arranged lines, which at first sight convey the idea of a natural twisting of the body; this however is more apparent than real, being likewise more marked in some individuals than in others. The body of the female, toward the tail, exhibits a de-

cided tendency to fold upon itself; and, in one instance, this feature was very significant (fig. 3). The lower part of the body preserves a tolerably uniform thickness almost to the extremity, where it is suddenly constricted to form a narrow, mucronate, pointed tail, scarcely visible to the naked eye. Employing a pocket lens, it is easy to observe through the transparent integument the spacious digestive canal, surrounded on all sides by sinuous foldings of the ovarium, tuba and uterus—the vagina terminating laterally at a point corresponding with the line of the upper fourth of the body. Here the male is usually found rigidly affixed by means of a strong membranous sucker, which proceeds from the lower end of its body. This cup-shaped appendage is formed out of a folded extension of the skin, which thus envelops the centrally-enclosed and rounded tail (fig. 4). The eggs are comparatively large, measuring, longitudinally, as much as the 1-250th of an inch (fig. 5). Many of the ova contain fully-formed embryos, and in the center of the lower third of the body of one of them I distinctly perceived an undulating canal, probably constituting the as yet imperfectly formed intestinal tube. By whatever mode the young make their exit from the shell, it is manifest that prior to their expulsion they are sufficiently developed to undertake an active migration. Their next habitation may occur within the body of certain larvae, or even small land mollusks; but I think it more likely that they either enter the substance of vegetable matter, or bury themselves in the soil at a short distance from the surface. "In the South it has been observed that chickens kept

on the same run were attacked year after year, but escaped attack when removed to a distant new ground during the winter. Fig. 6 shows an egg with the embryo in an advanced state of development.

We give on this page another engraving of the gape

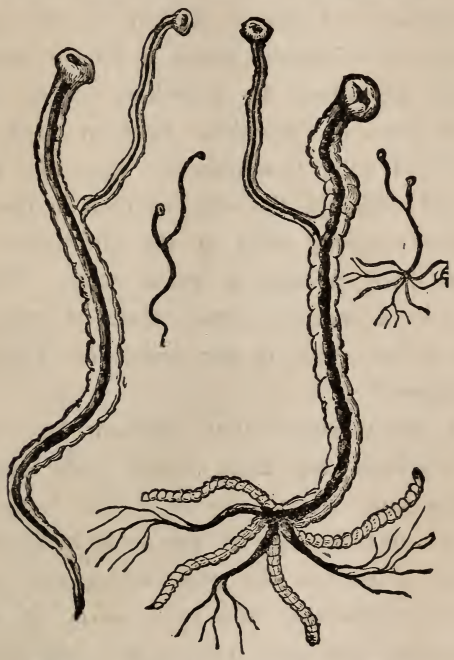


Fig. 1. Fig. 3. Fig. 2. Fig. 4.

parasite, showing the female as she sometimes appears loaded with eggs.

The gape-worms herewith delineated are the largest we ever saw. Figs. 3 and 4, full-grown gape-worm, natural size, male and female. Figs. 1 and 2 the same largely magnified. The size of this worm, as found in the throat

or gullet of the chicken, is smaller by one-half usually, and from that extreme down to the length of a third or fourth of an inch, or less. A female specimen in this state was described by Mr. F. F. Martin, who wrote to Mr. Bement, the author of *The American Poulterer's Companion*, as follows: "I lost a chicken by the gapes, and on examining its windpipe found a female worm in it, differing from the others by branching off at the tail in a number of roots or branches, between each of which were tubes filled with hundreds of eggs like the spawn of a fish; and although the chicken died in the morning, the worm was perfectly alive in the afternoon, and continued so for half an hour in warm water. While I was examining it in a concave glass, under a microscope, it ejected one of its eggs, in the center of which was an insect in embryo."

Mr. J. J. Black asserts that chickens kept free from lice are also always free from gapes, and thinks, therefore, that the gape worm is one of the forms assumed by the louse. But the egg of the louse is known and is not the same as that of the gape worm, and no species of louse ever assumes the form of a worm, at any stage. Perhaps, however, the louse carries the eggs of the gape worm, or perhaps the same treatment and cleanliness kills both, which last is quite likely.

One observer reports that his chickens had always suffered severely from gapes, until he changed by accident, their food from wheat-screenings to whole corn, using the cracked corn or the whole grains after the birds were old enough to swallow them.

Symptoms. The disease occurs most frequently in July and August, in unthrifty fowls, or those kept in unclean places, fed with unwholesome food and impure water. The whole windpipe is sometimes completely filled with the little worms, and in order to breathe the fowl throws up the head and gasps. It sneezes also, or makes futile attempts to swallow. As a consequence, the birds lose their general health, droop and generally die. Very young chickens are those most usually attacked. In older fowls the windpipe is larger, and the current of the breath stronger, and the worms might more easily be expelled, or would not cause so much disturbance if present; at all events the disease is not commonly noticed in these.

Treatment—is very necessary, or the fowl will probably die. The easiest treatment, and it is sure, is to put some carbolic acid, of the clear, transparent quality into a spoon or metal saucer, and hold it over a lamp. Dense, white fumes will arise. Hold the chicken's head in these until it is nearly suffocated. Or, shut all the affected chickens into a box and fumigate them together, but watch them closely lest they be killed. Burned sulphur fumes will also do very well for this purpose. The vapor of spirits of turpentine, and of creosote are also recommended.

Another method is to take a feather, which has been stripped of all the webbed portion save its tip, and dip it into spirits of turpentine, or kerosene, and thrust it into the windpipe, and turn it around several times. Some of the worms will be killed, some will come out

with the feather, some will be coughed out at once; catch on a sheet of paper *and burn them all.* The opening of the windpipe is easily found at the base of the tongue. Mr. T. Connor writes: "For chicks, from two to six weeks old, take a quill about six inches long, and strip it to within three fourths of an inch of the top; then double it about one inch from the point, so as to make a point of the doubled portion, as it is very difficult to get the end of a quill into the windpipe of a small chick." See cut herewith. Fig. 1 represents the feather stripped; and fig. 2 the same after being bent. Have an assistant hold the chick, then take the chick's head in the left hand, open the beak with the thumb and fore-finger, look over the tongue and you will see the valve to the windpipe; take the quill and dip it into a solution of one part of water and three parts of spirits of turpentine; then be sure and get the doubled point in the windpipe and push it down gently as far as it will go; twist it around in a lively manner, at the same time draw it out, and, if done correctly, you will bring the worm. Put in the quill three times and your chick is cured of the gapes.

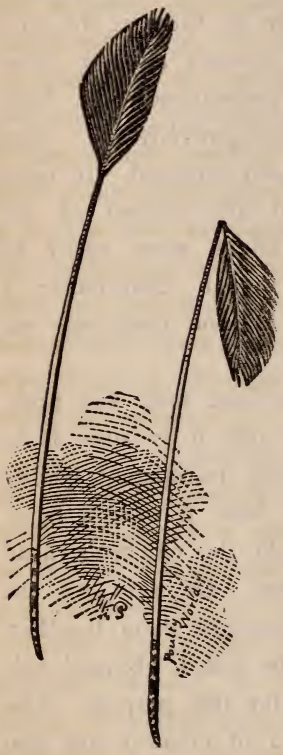


Fig. 1. Fig. 2.

I never failed to cure the worst case of the gapes in this way. The larger the chick is, the larger the quill must be, as the end of the quill must nearly fill the windpipe, and the end of the feather being put in double has a better chance to take out the worm, as the top of the feather comes out small end first. The spirits of turpentine is used to kill any worms that may remain."

In some cases the windpipe has been found so full of insects and suffocation so imminent, that it has been found necessary to open the windpipe by cutting into it from the outside, in order to remove the parasites. This is not so difficult an operation as it seems, the main trouble being to hold the windpipe steady during the proceeding. Sew up the hole, taking care to stitch only the external skin. and the chicken will very soon show signs of improvement.

Internal treatment is sometimes recommended, such as crushed corn soaked in alum water or kerosene. After recovery the fowls should be carefully nursed for awhile; those who have died of the disease should be burned, if possible, or removed, to prevent the infection of others.

When the disease has appeared in a flock, fluid carbolate, or camphor, or lime, should be added to the drinking water, to prevent infection, and the sick should be put by themselves.

As the subject is very important we add still other methods of treatment recommended. Camphor has been given in pills the size of a pea, with success. Alum and sulphur in the form of fine powder, blown down the

throat, will destroy the worms. Lime in the air will also effect the purpose, and may be applied by putting the chickens into a box covered with fine muslin and sifting fine lime through this, but not so fast as to smother the chicken. Another method, by some deemed doubtful and dangerous, is to pinch the chicken's throat; this will crush the worms and cause them to loosen their hold, when they will be coughed up.

§ 30. *Gaping.*—Any obstruction in the windpipe, as mucous from a hard cold, will cause the chicken to gape as in the disease called gapes. The fancier can discriminate by the less serious nature of the affection, and at any rate the treatment for gapes will do no harm.

§ 31. *Pip* is a name applied to a condition, in which there is a dry horny scale at the end of the tongue. The best authorities agree in considering that it is merely a symptom of some disease elsewhere, commonly some affection of the air passages, which causes the fowl to breathe through the mouth, the tongue becoming for this reason dry, and the breathing being noisy, "zip," "zip," whence the name. Indigestion may also cause it. Those who treat "pip" as a serious disease prescribe daily two or three grains of black pepper in fresh butter, which will stimulate the digestive system; the bit of garlic daily, as recommended by some, is useful in the same way, and also by stimulating the lining membrane of the air passages. Diet carefully.

In indigestion a dose of castor oil may be given. Apply chlorinated soda to the tongue, if you want to do something. Do not cut off the tip, as formerly recom-

mended. The homœopaths give Spongia three times each day.

Some old poultry men do not believe in pip, and claim never to have seen it, or the hardened tongue-tip said to characterize it. The name used to be given to a great many different disorders.

DISEASES OF THE DIGESTIVE SYSTEM.

§ 32. *Cholera.*—This name is given to a disorder of obscure origin and character, which has proved itself to be one of the most rapidly destructive known to poultry keepers. It is comparatively a new disease, having appeared within the last fifteen years in its present shape, but is becoming more common. It is by far most common in the South and West, where also it is most fatal. Epidemics of it occur annually in the Middle States. It has not often appeared in the Eastern States; acute observers of wide experience never having met with it; certainly it is very mild there. In this connection, however, it will be well to read the general paragraphs at the beginning of this book. All that can be said is that no disease of this intensity and high rate of mortality has occurred in New England.

The causes of the disease also do not need to be detailed here at great length, after what has been said in the paragraphs on food and housing. Anything that tends to lower the constitutional vigor of the fowl will render it liable to an access of this disease.

Unwholesome food, given at irregular periods, impure and stagnant water as a drink, exposure to the weather

or to the depressing heat of the sun without shade, all of these causes, so readily enumerated, increase the liability of the fowl to this disorder, as well as to many others. Dr. A. M. Dickie points out that the "more active and restless breeds are less exposed to its ravages; that older, adult birds are first attacked, although no age is exempt; that on damp clayey soil the disease is more prevalent than in dry, porous or gravelly soils; finally that very large and high fed fowls" soon fall victims. All this is very easily understood on general grounds, with perhaps the exception of the point regarding adult birds.

Among the causes most prominent in fostering the disease is, it is agreed on all hands, an over-crowded condition of the coops. In the first place such a condition of things is directly depressing to the fowls; in the second place, the bad air makes good soil for the development of poisonous "germs," if any such there be. Cholera has been known, however, to attack flocks that are not kept in houses at all. Such cases can be explained by the fact that fowls thus kept are generally badly protected from the weather, and besides this, they really crowd together at their roosting places, which are sure to be tainted by an accumulation of droppings.

Cholera seems also to be more prevalent in very hot and in very dry seasons.

It is thought to be infectious, but the infection does not seem to travel very far. Fowls roosting near fowls sick with cholera will catch it, but whether from them or from their droppings does not appear. This is the gist of the grounds of the statement that the specific

poison which produces cholera is generated locally on premises where the disease exists.

Scientific.—The question now generally asked is, What is the nature of the disease? Is it a special poison, or is each case one of ordinary diarrhœa or dysentery, aggravated by the enfeebled condition of particular fowls or particular flocks. This question cannot be definitely answered from the standpoint of our present knowledge, but observers of eminence are of opinion that it does depend on a special poison, which comes into the fowl from without (just as a seed may be planted in the ground); that this special poison first affects the blood, and that the deteriorated blood produces the changes in the liver and so forth which constitute the disease. But this question can not be fairly understood by those not possessed of some general scientific knowledge.

It is called cholera, because as in the Asiatic cholera of the human race, it is accompanied with much diarrhœa, is very fatal, and attacks many individuals at a time, but it is an altogether different disease.

It is not typhus fever, and to say that it is marked with typhus or typhoid characteristics means generally but little more than that it is disease accompanied with a very enfeebled state of the system. Some writers, however, mean by this that it may be generated anew in the noxious exhalations produced by crowding, just as typhus fever is, and not necessary always brought from somewhere else, as small-pox is. This is a useful application of the word. Typhus fever, however, after it is once produced, can be carried, and so, possibly, may chicken cholera.

The name Cholera, to which we have become too well accustomed, is probably as good as any that can be devised. "Septicæmia" has been suggested, but, to say nothing of the impossibility of persuading farmers to learn and use the term, it could apply equally well to any other blood poison, such as is perhaps roup.

Lesions.—The organ most changed is the *liver*. This is found enlarged, dark green, full of dark blood, congested, and unusually tender; it can easily be crushed in the hand. The *gizzard* is softer and sometimes much smaller than natural, and contains half-digested food. The *crop* and *intestines* are often full of sour, fermenting food, and ulcerated, and the intestines are much inflamed and "sore," that is, excoriated. The testicles have been found much altered. The condition of the liver now is the main thing to be noted. Of course, you will find the brain, nerves and lungs more or less congested, full of darker blood than usual, and the heart perhaps enlarged. The blood is darker and thicker than usual, and this condition, together with that of the liver, are thought by Dr. Dickie to exist in no other disease. The liver is not only the organ the most altered, but apparently it is the one attacked first.

Symptoms and Diagnosis.—The disease must be made out, before death, rather from its sudden epidemic character than from anything else. It comes suddenly in some cases; a fowl well to-day may be dead to-morrow, and a whole flock may be thus rapidly carried off.

The discharges are thought by some authorities to be decisive. These are mild at first, are yellowish green,

"or like sulphur and water," becoming thinner, greener and more frothy as the disease goes on, and never stopping until the fowl is dead. "The breathing becomes heavy and fast, the crop fills with mucus and wind; at last the food is not digested, the eyes close, and in a few hours the fowl dies."

There is weakness, sometimes extreme, at the commencement of the disease; the fowl may even be unable to stand well. It does not plume itself, and has a general sleepy, moping appearance. At a later period, the dark, thickened blood may turn the comb and wattles dark, or may not readily flow through them, so that they become pale.

There is much fever, great thirst, and a rapid, weak pulse. Cramps may occur.

The fowl may die from the digestive disturbances, or apparently from paralysis of the heart or lungs, caused by the poisoned blood.

Treatment.—You cannot save the lives of all those attacked, neither will the same treatment that is good in the North succeed in the South. *Remove your whole flock at once to clean quarters*, if possible to some gravelly site that has never been used before for stock, and see that they are healthily housed there, and in all regards in a healthful condition. *Separate the sick from the well*, and if it were possible it would be well to have every hen, *especially every sick hen*, have a place apart. This is practicable enough with some valuable pets. If you cannot remove your flock, carry out the directions for cleaning up given in §§ 6–12.

This is a case when it would be advisable never to use the same site again, nor, if the material of the buildings happens to be, as is sometimes the case with poultry houses, worthless, the same building. Make firewood of the whole.

The following is the treatment of the sick fowl recommended in the valuable treatise of Dr. Dickie: "Fowls that are too sick to eat should have every four or five hours a pill made as follows: Blue Mass 60 grains, Pulverized Camphor 25 grains, Cayenne Pepper 30 grains, Pulverized Rhubarb 48 grains, Laudanum 60 drops. Mix and make into twenty pills. When they have had time to act, give half a teaspoonful of Castor Oil and ten drops of Laudanum to each. Let them drink scalded sour milk, with a gill of Douglass Mixture (§ 21) for every twenty-five head, a day. The treatment ought to change the character of the evacuations and make them darker and more solid. When this happens, and not before, give them alum water or strong white oak bark tea to drink, and no other drink." This will tend to check the discharges.

E. O. B. of Penn Yan speaks well of the following recipe. Powdered garlic one ounce, aromatic tincture of rhubarb (or the common tincture), half an ounce, tincture of capsicum two drachms, tincture of camphor two drachms, tincture of oil of peppermint three drachms, tincture of opium one drachm. Mix and shake until the powdered garlic is thoroughly suspended. Dose six to eight drops in a teaspoonful of water thrice a day.

Some other recipes are a tablespoonful of a mixture

of equal parts of red pepper, alum, rosin and sulphur in three pints of scalded meal daily. Or two tablespoonfuls epsom salts, four of lime and ten drops of tincture of iron in a gallon of meal. A simple method, but of doubtful efficacy, is to confine the fowls to flour and water made into a stiff paste.

For the well fowls, and those not very sick Dr. Dickie recommends a feed of warm boiled potatoes, mashed with bran or wheat or oat meal or barley meal and sour milk, mixed with a little bicarbonate of soda and pulverized charcoal.

Petrolium is much praised and is very well worth trying; mix some drops of it with the feed.

The whole family of tonics and alteratives may be tried in the feed, not all at once, but one after another; Dr. Dickie's list includes: iron, sulphur, cayenne pepper, and soda. The German Roup Pills, on account of their tonic properties, are very useful in this disease. Put fluid carbolate or carbolic acid in the water.

But for the well fowls the writer has more confidence in removal and separation than in the whole pharmacopia. Calomel and blue mass, in two grain doses, or four grains of blue mass mixed with two grains each of gum camphor and cayenne pepper may be given twice a day. This is very well worth trying, for the reason that it may perhaps give the needed fillip to the liver, and put an end to the congestion of this organ.

As to *preventive* treatment nothing need be added to the directions for separation, and cleaning up, combined with proper and *very digestible* food, freedom from lice,

and so forth. Powdered charcoal is much used as a preventive, and is well worth trial.

§ 33. *Indigestion* may produce either constipation, by causing inflammation, or diarrhœa or dysentery. It may be accompanied by fever or loss of appetite, and apparently pain in the stomach. The crop is sometimes swollen, and the liver may become seriously affected. It is sometimes due to cold, but is generally due to too much or too stimulating diet. Cut down the diet to a little soft, bland food, limit the water supply, and give cut green grass. Five grains of rhubarb changed every fourth day for one grain of calomel is recommended by Wright in addition. It is going to be very difficult to detect disorders of the liver, but a "sickly yellowish look about the head and comb," with general inactivity is to be looked for. Dosing will do no good; calomel, one grain every other day may be tried. Indigestion in young chickens may cause depression of the breast bone.

§ 34. *Liver disease.* See indigestion. Dr. Hinton thinks that Cochins bred in cold and damp places, often have a strumous disease of the liver; they emaciate, and appear sickly about the head, and die suddenly, the liver being soft, with masses of cheesey matter scattered through it, with perhaps a ruptured blood vessel. He recommends small doses of mercury, followed by cod liver oil and Parrish's food; we recommend the hatchet. For enlargement of the liver, feed low, and give a little calomel now and then.

§ 35. *Diarrhoea and dysentery.* See indigestion. Too much green food may cause it. Mr. Tegetmeier preferred

twice a day a pill of powdered chalk five grains, rhubarb five grains, cayenne pepper three grains, to which in severe cases add half a grain of opium. Chalk, in fine powder, on well boiled rice will sometimes check it, without medicine. Six drops of camphorated spirit make a good dose, on barley meal. Restrict the drink, and put a little tincture of iron in it, or alum to check the diarrhœa. "Bone dust," Wright says, "prevents diarrhœa."

A bad diarrhœa, with bloody evacuations, probably affecting more the lower part of the gut is called dysentery. A bad disease to cure. Give a dose of castor oil, and follow with laudanum, five drops every few hours. Rest is important in diarrhœa and dysentery, as well as an early diagnosis from cholera. If you are not certain put the sick fowl by itself, which is a good point in the treatment of all these diseases, as the fowl is less apt to be disturbed. For diarrhœa, the homœopaths use ipecacuanha; arsenicum, if a bad diet be the cause, and chamomilla; each in doses every two hours. Diarrhœa, despite of treatment, may become very chronic. Try sweet oil internally.

§ 36. *Constipation.* See indigestion. Change the diet. It is often owing to want of green food. The homœopaths give aconite as long as the fowl is restless, and follow up with nux vomica. If the constipation follows a cold, bryonia.

§ 37. *Crop bound.* From some or other obstruction, sometimes a piece of bone, sometimes whole corn, any undigested food, the food does not pass into the stom-

ach and the crop gets swollen and hard to the feel. The fowl is uneasy and tosses her head about. It is a form of indigestion, and may pass off without treatment, except the natural one of low or better no diet. If not, pour down the throat some warm water and knead the crop gently for an hour or so until it becomes soft, then give a dose of castor oil and leave the rest to Nature. If this fails to succeed, make a cut in the crop, about an inch long (more if you must), at the top, and remove the contents with a spoon-handle. Then pass the greased finger, after having pared your nail blunt, into the crop to see if all be clear, and sew up with white silk or horse hair, taking good care to stitch only the outer skin. A very small cut needs no sewing. Feed the fowl afterwards on very soft cooked food, for a week, with but little water (none at all for a day). The outlook, if this be done, is better for your patients, than for your patience.

Wright mentions a form of swelled crop coming from over drinking, to be cured by very low feeding, and little drink, the principle being to allow time for the organ to rest to recover its tone. Half a teaspoonful of sal-volatile in a teaspoonful of water every morning; the green food to be chopped onions or garlic. Some stimulating tonic may also be mingled with the food.

§ 38. *Inflammation of the Proventriculus or fore-stomach.*—Inflammation of the stomach in fowls as in men, will come from improper, especially too stimulating diet. It may be suspected, Tegetmeier says (it can hardly be certainly recognized), when the fowl, without apparent cause

pines away, and persistently chooses only the softer articles of food. The only treatment likely to be beneficial is to give a very bland and soft diet. The occasional grain of calomel recommended by Tegetmeier will do no harm. The water drunk should not be too cold. But, after all, what is the use in prescribing for a malady that no one will detect?

RHEUMATISM, ETC.

§ 39. *Rheumatism* generally comes from exposure to cold wet, as by running in the wet grass in the morning, wet roosting places, etc. The malady is hereditary. The symptoms are leg weakness, stiff joints, or contraction of the toes. It may lead to a fatal inflammation of the heart. The treatment consists mainly in warm, dry quarters, and good stimulating food; a little cooked meat every day. Rub the legs well with hot mustard water, afterwards wiping quite dry. Half a grain of opium (a quarter of a grain for a chicken of three months), night and morning will soothe the pain.

§ 40. *Cramp.*—See rheumatism; same causes, same treatment. Often no diagnosis can be made.

§ 41. *Gout.*—Frequent in the Asiatics. The feet are hot, swollen and inflamed. Keep the fowl warm and well fed. Open the bowels with a grain of calomel at night, and administer colchicum twice a day, three drops of the wine or a half grain of the extract. Rub the limbs with sweet oil. The homœopaths advise Bryonia for turkeys.

§ 42. *Leg Weakness.*—Fowls, especially cockerels that

grow too fast, squat down on the ground. Sometimes there is also a deficiency of earthy matter in the bones. Bone dust may be freely used. Feed with substances which do not tend to fat; wheat, barley, meat. In warm weather dip the legs in cold water twice a day. Internally may be given iron, three to eight grains of the citrate daily, or some form of iron and quinine. Hinton's recipe is sulphate of iron one grain a day; strychnine one sixteenth of a grain, phosphate of lime five grains, sulphate of quinine half a grain; thrice daily.

§ 43. "*Break down behind*," may come from trouble in the oviduct (see § 56), or from over-fatness, especially in the Asiatics. Low diet will of course remove the latter difficulty. It appears also to be connected with internal enlargements. The difficulty is not often satisfactorily cured.

§ 44. *Paralysis of the Legs* may follow an attack of apoplexy, which see, or may come from spinal disease. It may also attend the cracking of the hock joint (§ 65), or gout or rheumatism, or may appear as a temporary ailment; of obscure origin, from which the fowl soon recovers.

DISEASES OF THE BRAIN AND NERVES,

§ 45. *Apoplexy, megrims, giddinesss, paralysis.* These affections can be very conveniently treated together.

(1.) If the blood rush to the head, the fowl feels dizzy, and may stagger "as if drunk," or run in circles.

(2.) If under these circumstances the amount of blood in the head be increased, the brain suspends its activity

and the fowl falls senseless. This is called apoplexy. When the blood flows away again the fowl will recover, *unless*—

(3.) The influx of blood to the brain has been so strong as to burst a blood-vessel, in which case the fowl may die at once, or if it recovers may recover with part of the torn brain so impaired that that part of the body which is controlled with this part of the brain cannot be used or, as we say, is paralyzed.

(4.) The attack of apoplexy may be instantaneous without preceding giddiness.

(5.) Probably the influx of blood, into the brain, may be so strong that the fowl may die even without the bursting of a blood-vessel.

(6.) A very weak blood-vessel may burst without much influx of blood to the head, and cause apoplexy.

(7.) There may be bursting of a blood-vessel and the destruction of a little of the brain, resulting in paralysis of some part, even without falling or without loss of consciousness.

Every part of the body is under the government of some part or other of the brain.

These troubles are generally remotely due to over feeding especially with Indian corn in some breeds, but any over stimulating food may be the cause of it. It is not probable that a blood-vessel will burst that is not already in some way weakened by disease, and if it be very weak it may burst from a slight exertion as when a hen is straining to lay an egg, or with no exertion at all. When a hen dies from apoplexy, therefore, she

commonly dies of an old disease, and you are well rid of her.

A paralysis may come from other causes; from a diseased or injured spine. And in gouty and rheumatic affections and in some skin diseases, the legs may become useless. See also leg-weakness.

You will, however, be able to know nothing of these diseased blood-vessels until you see the fowl senseless or paralyzed.

Treatment.—Prevent by judicious feeding. (*a.*) Suppose a fowl shows signs of being dizzy, by staggering or walking in a circle. Hold the head under a stream of cold water; this will drive out the blood. Afterwards give low diet for a while, and physic at once with castor oil or fifteen grains of jalap with one of calomel. Calomel is too slow to rely upon alone, but one grain with fifteen of jalap is a good combination. Podaphyllin, in doses of one grain, is a rapid and useful purge. Bromide of potassium, as recommended further on, may be useful in such cases, to "help the nerves."

(*b.*) Suppose the fowl drops senseless, is attacked with apoplexy. If she has really burst a blood vessel you can hardly save her and she is not worth saving, but it may be that the damage has not yet happened, and prompt, very prompt action may keep the blood vessel from giving way under the pressure. The cold water will hardly prove enough, and she must be immediately bled. Cut into the large vein under the wing, cut it lengthwise, not across, and let the blood run freely. When consciousness has returned, and after a little while

stop the bleeding with alum or by pressing on it with the finger. The fowl will be apt, if not watched, to peck it open and set it to bleeding again. Another way to bleed is to scarify the comb and wattle. After recovery feed low, and physic with castor oil, not quite so vigorously, however, as for mere giddiness. Your bleeding will have weakened the fowl somewhat.

(*c.*) If paralysis results, and you really want to try to save the hen, wait *two days or so*, until the hen begins to hobble about and act naturally as to eating, and so forth, and begin with strychnia, one-sixteenth of a grain twice a day. She may recover, though slowly. Bromide of potassium, ten grain doses, three times a day to an adult cock, is safer. But it is seldom worth while to save such a specimen.

We have described Apoplexy and Megrims fully, more to show that there is no use fussing with these troubles than with the expectation that it will generally be worth while to use medicines for them. Still as sometimes an exhibition fowl sells for as much as a good horse, careful treatment may pay. As will of course occur to the reader, the poultry-keeper (aside from the rainy Sundays of the enthusiast) does not stay constantly among his fowls, and cannot be expected to watch every symptom, hence the utter impracticability of many of the methods of treatment given in this volume. We have taken great pains, nevertheless, to make this treatise complete, because we receive letters constantly referring to all sorts of diseases, and detailing every imaginable symptom, and calling earnestly for instructions. No malady, roup and chol-

era excepted, is alluded to by our correspondents oftener than "megrims," or some phase of paralysis.

§ 46. *Neuralgia* as a brain trouble in its origin ought to come here. A writer says it is a temporary ill. We would like to see him make a temporary, or a permanent, diagnosis. No doubt a hen may have pains that are not from rheumatism or other nameable cause, but how is one to know. She can't get toothache, anyhow.

§ 47. *Staggers in Geese* may be due to giddiness, or to worms in the ears. And once for all, any animal with parasitic animals in the ears is apt to suffer from symptoms so closely resembling brain disease that no one can detect the cause.

§ 48. *Convulsions* may come on as a result of brain disorder or in consequence of some unusual excitement. Rest alone will do much, if any, good. The homœopathic treatment begins with bryonia and then proceeds to nux vomica, one dose per diem.

§ 49. *Debility* may be placed here, as sometimes depending upon mal-organization of or injuries done to the nervous system, although often upon other causes. Shock or fright may bring this condition about, and the same condition of things may result from exhibitions. Rest and nourishing food are the best medicines. Some mild tonic may be administered. Quinine and iron mixture may be given. Wright recommends a raw new-laid egg every morning, until the fowl begins to recover, then to change for a little cooked meat, and no tonic except perhaps a little muriate of iron in the water.

§ 50. *Feverishness* is always a symptom of some other

disorder; frequently however of a mere temporary disturbance in digestion. Watch the fowl closely. A fever following fighting injuries may be allayed by pouring cold water into the wounds. The "sitting fever" ought not to be dealt with harshly, by ducking the hen, etc., barbarities of a past age.

DISEASES OF THE OVIDUCT, ETC.

§ 51. It is necessary to acquire some knowledge of the anatomy and physiology of the organs concerned in the making and laying the egg, in order to understand the accidents that these organs are liable to, and this process we will endeavor briefly to describe. The egg first appears, to speak loosely, as a very small portion of yolk, in the ovary, here it is fertilized and here it remains until it reaches in its regular turn the time to be laid within a few days; it then breaks away and slips into a canal, where it becomes, as it goes (the small end first), covered with the albumen or white, until it reaches a larger part called the uterus, where it is finished, receiving finally the shell. The various layers of the yolk, and of the white, which can be easily shown after boiling, comes from the successive additions of the layers. The shell looks "pitted," because the uterus is lined with little villi or protuberances, which indent it a little. The time taken to traverse the narrow or white making passage is four to six hours; the time spent in the uterus is twelve to twenty hours. The completed egg passes into the general passage or cloaca and is expelled,—"laid." Fig. 1, shows the ovary, which resembles

a cluster of fruit. Fig. 2, shows the canal or oviduct in the act of receiving the partially formed egg after it has broken away from its sac in the ovary. Near the lower end of the oviduct an egg is shown perfectly formed and ready to be laid.

§ 52. *Inflammation of the oviduct* results from taking cold or from over-stimulating or unwholesome food.

Fig. 1.

The symptoms are general feverishness; the feathers on the back and rump are puffed out, and the hen is continually straining as if to lay an egg, partly from the swollen state of the lining membrane, no doubt. She will lay eggs varying in imperfection according to the part of the oviduct affected, these being sometimes soft-shelled, sometimes bare yolks. Treatment: Remove the hen for a long time from the cock. Give a grain of calomel with one tenth of a grain of tartar emetic in meal, followed by another next day, if the first does not give relief.

§ 53. *Soft Eggs.*—A diagnosis of the cause is important. Soft eggs may come from the above affection or

from the want of shell food, from eating ergot, from the fowls having been worried and driven about, or from being over-fed. Lime-water as drink makes good shell material.

§ 54. *Eggs broken in Body* generally prove fatal. Among the symptoms are bagging down behind. The egg may be broken merely by straining. Inject a small quantity, say a teaspoonful, of castor oil.

Fig. 2.

§ 55. *Egg Bound.*—The hen comes off the nest without laying and walks about distressed, hanging down her wings. Sometimes she remains on the nest. Give a full dose of castor oil. If this is unsuccessful, wash the vent well with warm water and then pass in an oiled feather, or better, inject an ounce of sweet oil. The egg is too large. This is more common with Polish fowls. Eggs have been known to accumulate here and form a large tumor. Tapping the egg has been recommended, but this is a very dangerous experiment.

§ 56. *Hernia, or Protrusion of the Gut*, may follow the laying of an unusually large egg, and is another cause of "breaking down behind." The parts can be returned by bathing them in blood-warm water, oiling them and

pressing them back very gently. But they are very apt to return a number of times. Feed the hen on diet that does not foster the production of eggs, as rice and potatoes, and counteract any tendency toward inflammation with the calomel and tartar-emetic pill given under Inflammation. The homœopaths would use Aconite or Arnica under such circumstances.

§ 57. *Diarrhœa.*—A form of diarrhœa appears to occur in old birds from the dribbling away, in a liquid state, of the secretion of the shell-making apparatus. The matter discharged is in this case white, although it may be mingled with the ordinary discharges. But the dribbling is continuous. The whitish matter accumulates on the posterior feathers in the form of a dry crust of a chalky appearance. We believe this is the first printed description of this peculiar deposit.

SKIN DISEASES.

§ 58. The subject of skin diseases is rendered somewhat difficult from the fact that the various eruptions and sores so easily take on various shapes under irritation, and so forth. In all cases strict cleanliness ought to be observed. Cases of eruption about the head, so reported, often turn out to be roup. Isolate all suspected fowls.

§ 59. *Ulceration or Canker* of the head, as described by Wright, would certainly be considered roup by poultrymen in this country. "It begins at the eyes," but this is a matter of not much consequence in diagnosis, as the nasal mucous membrane may also be affected.

See *Roup* for local symptoms, and treatment with Labarraque's Solution, isolation, etc.

§ 60. *White and Black Comb.*—White comb attacks chiefly Cochins, but may attack any fowls kept in small and unhealthy localities, and deprived of fresh vegetables. The disease consists of a whitish scurf, sometimes described as a dust, which begins at the bottom of the comb, then covers the whole, then attacks the wattles, and then the skin of the neck. The feathers die off and leave the bare quills, *or these may drop off.* The hen may die. Some observers think it contagious. *Its real nature is a fungus or vegetable growth*, which fact might explain the contagion. The treatment must begin with putting the hen under proper circumstances and correcting the error in diet. Put sulphur and tar ointment on the place. Turmeric is said by Wright to be a specific; he uses it in an ointment of cocoa-nut oil one ounce, and powdered turmeric one quarter of an ounce. If lard is used instead of cocoa-nut oil, the fancier should take care to mix it fresh for every application, and clean carefully the parts occasionally. Stoddard's Poultry Ointment is the best thing we know of for this disease.

Internally, after having given a dose of castor oil, give a teaspoonful of powdered sulphur in the food daily for ten days. This is cheaper and more convenient than the Plummer's Pills (Compound Calomel Pills) recommended by some in five grain doses, every other night for a week. The homœopaths give Sulphur at first, and follow with Staphisagria, three times a day. The feathers will reappear next moulting time. A condition called *scurfy*

skin sometimes appears here, from the same cause, with the same treatment, and may possibly be essentially the same thing.

Wright speaks of the *Black Rot* in Spanish fowls: "A blackening of the comb, followed by swelling of the legs and feet, and emaciation. Treatment is efficacious only in the earlier stages, and consists of a dose of calomel or castor oil, followed by some simple tonic, with warm and nourishing diet."

§ 61. *Red spots* on the faces of Black Spanish and on the ear-lobes of Leghorns and other white ear-lobed breeds, come sometimes from keeping the sexes together, and can be relieved by keeping them apart. Whiskey (the best for this), or spirits of turpentine, or sweet oil, will whiten the ear-lobes. Keeping fowls in a dark place previous to exhibition serves the same purpose.

§ 62. *Itch.*—An itching eruption, accompanied with some loss of feathers, may appear in summer in fowls kept in unclean places and without fresh water, even where there are no vermin. Greater cleanliness must be practiced. The homœopaths treat it regularly, beginning with Sulphur, giving a dose every day for three days, following with Staphisagria, and closing again with Sulphur. They give Dulcamara if the eruption is vesicular. This is not the itch of the human species, which is due to a minute parasitic animal under the skin.

§ 63. *Chicken Pox.*—Chicken Pox is characterized by the appearance of a number of small ulcers on the head and face, which become covered with scabs. It should not be confused with Roup, nor mistaken for the ailment

known as scurvy face, in which dry, bony scales cover the sides of the face and comb.

Chicken Pox is contagious, but not particularly dangerous. Keep the parts clean with castile soap and warm water, and apply vinegar or chloride of potassium. Sulphur may be given internally.

§ 64. *The White Leg* of many breeds, particularly Cochins and Brahmas, may be caused by a discoloration from wood ashes, although it also appears in birds kept upon dry, lime-rock soil.

§ 65. *Cracked Skin inside the Hock* may almost deprive the fowl of the use of its legs. Some stimulating ointment, such as fir balsam ointment, may cure it. It is best, however, to prevent the cracking, and you can anticipate it by observing that the fowl seems shaky about the hock joints, and is inclined to favor his limbs. At this stage, before the cracking, bathe frequently (thrice a day) with ammonia liniment (olive oil and ammonia), and give twice a day a pill of the size of a common white bean, three fourths lard and one fourth cayenne.

PARASITES.

§ 66. *Worms.*—Internal worms pull down the general health of the animal, although it is probable that they would not get seated, were it not for some or other unhealthy condition of the digestive organs. The only reliable symptom of their presence is finding them in the evacuations. Improve the fowls' general health. A good dose of castor oil, and after this sulphur in the food, may do some good. The homœopaths give Cina, and

after this two doses of castor oil weekly. "*Staggers*" in geese may be due to worms in the ears.

§ 67. *Scaly or Scurvy Leg—Elephantiasis.*—This disease attacks chiefly old birds of Asiatic blood. It attacks the shanks and is due to the presence of a parasitic, microscopic insect called *sarcops mutans.* This insect may also attack the comb. These insects, their cast-off skins, eggs, and the overgrowth of the epidermis caused by their presence causes grayish white swellings on the leg perhaps half an inch thick, which may ulcerate. It is contagious, and may attack even men and horses. The insect is a species of the itch family. Stoddard's Poultry Ointment is a specific and will cure. Another ointment is made of equal parts lard and coal tar. Turmeric and cocoa-nut oil ointment is also used. Other applications are vinegar or glycerine. Some wash with a weak solution of sugar of lead in the morning, applying ointment of creosote in the evening. Either of these remedies may be resorted to when Stoddard's Ointment, which is the best, is not at hand. There is no danger in keeping this ointment on your premises, as it is not in the least poisonous to the human family, to fowls, or to anything but insects. Put the fowl into a warm dry place and scrub the affected part well with a hard nail-brush and soap in warm water, to remove part of the scurf. This disease has sometimes been described as itch.

§ 68. *Lice* may be the cause of great depression, loss of health, and even death. These lice are bred very abundantly in all dark and filthy places, and getting on the fowls, absorb their juices, thus by degrees wearing

them out. The symptoms may lead the observer to think of some grave constitutional disease, and hence this matter should always be looked to when poultry are sick. The tufts of crested fowls form a favorite shelter for parasites.

The treatment consists of two parts, the treatment of the houses and of the fowls themselves, neither of which must be negleted. For the treatment of the houses, nest-boxes, etc., see §§ 6, 11.

For the fowls, Persian Insect Powder is very useful. Other remedies are as follows: A bath of one part carbolic acid to sixty of water, into which the fowls are dipped; suds of carbolic soap may be applied to the hens here and there, especially on all places underneath the wings, etc., but this should be done carefully, and in cold weather care should be taken that the fowls do not take cold; carbolic powder may also be used for the purpose, or powdered sulphur. Under the wings of full-grown hens, an ointment of lard, sulphur and kerosene may be applied, but be careful how you apply kerosene to small chickens. Whale oil, or lard oil, or simply lard, rubbed on the latter will sometimes answer. Tegetmeier relies confidently on one remedy, sulphur alone, well rubbed in. Some fanciers prefer yellow snuff. Wormwood tea is a good wash, also tansy tea. Oil of fennel may be rubbed on the neck and head. Give tonics for the debility. The homœopaths give Absinthium and Sulphur internally; and the last, internally, in much larger doses than theirs, would not be a bad thing.

§ 69. *Red Mites* may become as bad as lice. The

measures here are, again, both general and individual. You must, however, use stronger measures than for lice. An English journal advises the following: "Two ounces of sulphur, two ounces camphor soda, half an ounce of carbolic acid or leaf tobacco, and a bit of quicklime the size of an egg, ground all together, and then steeped in hot water until the whole is well mixed. Pour off, and add a gallon of water to the solution, leaving out the sediment. Apply the liquid, when cold, thoroughly through the feathers, with a stiff, small sash-brush." This will, however, stain the plumage of light-colored fowls. An ointment of sulphur and lard, with one third kerosene oil, applied at the back of the neck, under the wings, and over the vent, will kill these and all other insects. Apply whitewash to the wood-work of the buildings to which the mites adhere.

§ 70. *Injuries.*—Fowls do not meet with very many injuries of a serious nature, so that the skill of the surgeon is rarely called for. Some of the minor accidents, however, such as the fracture of the leg and the freezing of the comb and wattles, are very annoying to the owner of handsome birds. As to treatment, the principles of surgery are the same for fowls as for men, differing only in the difficulty, and in some cases the impossibility, of making the fowl submit to bandages and other applications. We give, however, directions, hoping that in the case of valuable birds the fancier may be successful in the use of his mechanical appliances.

§ 71. *Cuts.*—Bring the lips of the wound together, after cleaning it from dirt, and fasten with strips of ad-

hesive plaster, leaving open a small part of the lowest part of the wound to allow of the escape of pus, if there be any. If an artery be cut, which may be known by its throwing out a little jet of blood in a fine stream, medical men generally "tie it," that is, tie around the end of the bleediug vessel tightly a piece of sadler's silk, leaving the knot to come away of itself.

If, as is most likely, the fowl does not allow your plasters, etc., to remain on the wound, you will have to let it pretty much alone. Keep it quite clean, especially of maggots, and pure water is the best thing to wash it with. Very cold water will generally stop bleeding; a little piece of ice is very useful for this purpose; also powdered alum, or alum dissolved in water. Nothing that you can put on it will, as a general thing, hasten the healing, except by keeping out dirt, maggots, etc., and for this purpose some preparation of carbolic acid, which any druggist will furnish cheaply, is excellent. Arnica is of no earthly use, inside or out.

If the wound does not heal kindly, but looks angry, and swells up too much, some stimulating application may do good. A fir balsam plaster or resin plaster may be put on. Sweet oil merely keeps out the dirt, by covering the surface with a thin, impenetrable pellicle, and if renewed often and sponged off carefully, may be useful.

Wounds that gape widely may be sewed up. Don't breed from any animal in whom a cut does not heal kindly.

§ 72. *Bruises.*—Let them alone, or if you must do something, put on some arnica; it does no harm.

§ 73. *Sprains*, *Lameness*, will also get well of themselves. A cold shower bath is a common remedy for human beings. But who ever detected a sprain in a fowl. Lameness may come from many causes, some of them serious constitutional disorders, and a lame fowl is an unsafe breeder, unless you know how the lameness came about. Gout, rheumatism, and paralysis are among the causes.

§ 74. *Fractures*, *broken limbs* are chiefly important, because the fancier should be able to detect them, not because he can do much for them. In some cases this will be easy, in some cases hard; it depends upon your knowledge of the feel of the sound bone.

It is not probable that you will be able to "set" it, and keep it in place. Frequently fractures will heal without any care, and perfectly well. If you feel like trying your hand at it, bring the broken ends of the bone together, into place, put a roller bandage over it, lay some light splints outside of this, and put a bandage over all. Or cover the limb with thick, soft paper, wet with white of egg, and put the splint over this. The paper will soon stiffen and hold the limb in place, even if you take off the splint. Keep the fowl by itself, and quiet—if you can. You ought to remove the bandages every few days and see that nothing is out of place. The splints ought to fit the shape of the limb. For broken wings, close the wing and tie the ends of the quill feathers together and don't let the fowl fly, even to perches.

§ 75. *Frost bites.* Frost bites affect the feet, comb and wattles. If you detect the trouble before the frozen

part has thawed (and an examination of your blooded stock directly after a cold snap is worth while), thaw out by friction with snow or cold water. and keep the patient where it is cool. After the thawing out, bathing in camphorated spirit, or compound tincture of myrrh (hot drops), and a thorough inunction of comb or gills with sweet oil or glycerine is recommended. Oiling the combs and wattles will prevent freezing, as they cannot get wet then.

§ 76. *Poisoning.* If poison be swallowed, force the fowl to drink by pouring water down its throat, and then hold it up by the feet till the contents of the crop run out at the beak. Repeat this process several times. Special poisons have particular antidotes, but these are very rarely needed in poultry practice. Concentrated carbolic acid has caused death when swallowed. Kerosene frequently kills young chickens, also mercurial ointment, when either of these are applied too freely for the purpose of killing lice.

§ 77. *Chills.* Young fowls are sometimes benumbed and apparently lifeless as a result of a chill. Dip them in water as warm as the hand can bear until they are revived and then put them into a warm place.

MISCELLANEOUS.

§ 78. *Boils, abscesses* cannot in general be stopped, although the homœopaths give aconite hourly where there is fever. When they are "ripe," open them at their lowest side, so that all the pus can run out. Open freely.

§ 79. *Bumble-foot* is a wart ending in an abscess after a skin bruise, as when fowls fly down from too high perches. It is questionable if "hard rubbing with strong liniment" or putting on lunar caustic or tincture of iodine will help the matter. They should be treated like other abscesses. It ought to be remembered that many abscesses, without treatment, fail to ripen. Sometimes cutting out the tumour and cauterizing the place with nitrate of silver will cure. Make a crucial cut, (thus **X**). Especially frequent in Dorkings, even where no bruise or other cause can be shown, and seems to be connected with their abnormal foot.

§ 80. *Yaws.* Another name for roup. Mosquito bites sometimes inflame badly and receive this name.

§ 81. "*Hen distemper.*" Contagious. The hens mope about and die rapidly. The skin around the anus, is high red with black spots. Occurs in hot and dry weather. Treatment: Thorough cleansing. The homœopathic remedy is nux vomica, thrice daily. Is this merely another name for cholera?

§ 82. *Sweat malady,* A hen hatching in a damp musty coop, sometimes becomes moist, clammy and blackish under the wings. Let her out, wash the parts, and powder with flour. It is disgraceful management to allow your fowls to sit in such places.

§ 83. *Deformities* of all sorts often hereditary. Never breed from such fowls. *Crooked breast bones* come from having perches too convex or narrow. *A wry tail* not connected with spinal deformity may sometimes be improved by dividing the tight tendon, or else by snipping

out a little of the flesh on the side of the loose tendon, the side to which the top of the tail does not point, and as it heals the contraction of the scar, aided by a little daily bending in the right direction, may drag the tail into shape. A *squirrel-tail* requires that the tendon on the back should be cut. *Toes connected by a membrane*, or web, in young chickens may be separated by cutting the membrane with a pair of shears. Shut the chicken up by itself, afterwards, in a clean place.

§ 84. *Sore eyes and head.* A wash of weak white vitriol, or alum water or alum and camphor combined has been recommended. Hens sometimes suffer from a merely temporary blindness. Sore eyes often accompany roup.

§ 85. *Break down behind.* If not from enlargement of the oviduct (§ 56), or intestine, or breaking of an egg inside, (§ 54), may come from too much fat here. Putting the hen on very low diet will of course cure her in time, but such a condition implies a poor constitution. Don't breed from her.

§ 86. *Fatty tumors* may appear in various parts of the body. They are harmless except from their size and perhaps local inconvenience. They may be cut out, taking care to keep enough skin to cover the place. Sew up the skin over the wound, leaving a little place at the lowest part for the pus to run out.

§ 87. *Feather eating.* This is a *vice*, not a disease, to which all breeds are liable, but particularly the French breeds and Malays. It almost always appears in hens.

You cannot cure all cases by means of diet. Animal food is most generally recommended, as fresh meat or

raw bones crushed small. If this fails, and it most often will, use *Loomis's Poultry Bit.* It is a sure thing.

§ 88. *Egg Eating.* This vice is prevented by having the nests in a dark place, and by giving fowls that are shut up plenty to do, by forcing them to scratch for a living, by placing all their grain under a pile of straw, leaves or dirt, and it is cured by the same means. If these fail, give the fowls an unlimited range, or use the hatchet. A few fowls having the trick will teach others.

§ 89. *Finally* we would add a few words explaining why we have described the symptoms of so many diseases in addition to the common ones of roup, cholera, crop-bound, megrims and leg-weakness. It is because so many correspondents write us asking for information. To dismiss these inquiries without reply would be very unsatisfactory. Also, in order to determine with certainty the more simple and curable diseases, the symptoms of many of the others must be known (See pp. 16, 17). Besides, it may be worth while to treat even the most complicated and difficult disease, when you have a fowl that is very valuable and which has shown a good constitution previous to the attack (See foot of p. 53).

If it is objected that we have mentioned too many sorts of drugs and medicines in this treatise, as though we were trying to "sling a whole apothecary shop," after the manner of too many family physicians, we would urge in defence, that frequently the fowl must be treated, if treated at all, with the medicines that the owner happens to have in the house, and if one sort we have mentioned isn't at hand another may be.

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